SEQUENCE LISTING

<110> Roberts, R. Michael
Green, Jonathan
Xie, Sancei

<120> COMPOSITIONS AND METHODS FOR EARLY PREGNANCY DIAGNOSIS

<130> UVMO003/UVMO003P

<140> Unknown
<141> 1999-03-19

<150> 60/078,783
<151> 1998-03-20

To760

<150> 60/106,188
<151> 1998-10-28

<160> 56

<170> PatentIn Ver. 2.0

<210> 1
<211> 1295
<212> DNA
<213> bovidae

<400> 1
cttggatcca ggaaataaac atgaagtggc ttgtgctcct cgggctggtg gccttctcag 60
agtgcatagt caaaatacct ctaaggagac tgaagaccat gagaaatgtc gtcagtggaa 120
aaaacatgct gaacaatttt ctgaaggagc atgcttacag tctgtcccag atttcttttc 180
gtggctcaaa tctaactact cacccgctga gaaacatcaa ggatttggtc tacatgggta 240
acatcaccat tggaacaccc cctcaggaat tccaggttgt ctttgacaca gcctcatctg 300
acttgtgggt gccctccgac ttttgcacta gtccagcctg ttctacacac gttaggttca 360
gacatcttca gtcttccact ttccggctta ccaataagac cttcaggatc acctatggat 420
ctgggagaat gaaaggagtt gttgttcatg acacagttcg gattgggaac cttgtaagta 480
ctgaccagcc atttggtcta agcattgagg aatacgggtt tgagggcaga atttatgatg 540
gtgtcttggg cttgaactac cccaacatat ccttctctgg agccatcccc atctttgaca 600
agctgaagaa tcaacgtgcc atttctgagc ctgtttttgc cttctacttg agcaaagatg 660
agcgggaggg cagtgtggtg atgtttggtg gggtggacca ccgctattat gagggagagc 720
tcaactgggt acccctgatc caagcaggcg actggagtgt acacatggac cgcatctcca 780
ttgaaagaaa gattattgct tgttctgatg gctgcaaggc ccttgtggac accgggacat 840
cagatatcgt aggtccaaga agactggtca ataacatcca taggctcatc ggtgccatac 900
cacggggttc cgagcactac gttccatgtt ctgaggtcaa taccctgccc tctattgtct 960
tcaccatcaa cggcatcaac tacccagtgc caggtcgagc ctacatcctc aaggatgata 1020
gaggccgctg ctataccacc tttcaagaga accgagtgag ttcatctaca gagacctggt 1080
acctgggtga cgtcttcctg agactgtatt tctcggtctt tgatcgagga aatgacagaa 1140
ttggcctggc acgggcagtg taaatgctta gagtggttca ggaatcagta aggccactcc 1200
taacacacac tcactcacac tttggcactc ctgcccagaa tgctggtgaa ctgtatttgg 1260
tggtcttcac actctattct tagtaaagaa taaag 1295

<210> 2
<211> 1258
<212> DNA
<213> bovidae

<400> 2
gaaagaagca tgaagtggct tgtgctcctc gggctggtgg ccctctcaga gtgcatagtc 60
attttgcctc taaagaaaat gaagaccttg cgagaaaccc tgagggaaaa aaacttgctg 120
aacaatttcc tggaggaaca agcttacaga ctgtccaaga atgactccaa aataactatt 180
cacccgctga ggaactatct ggatactgcc tacgtgggta acatcaccat tggaacaccc 240
cctcaggagt tccgggtcgt ctttgacaca ggctcagcta acttgtgggt gccctgcatc 300
acctgtacca gtccagcctg ttatacacac aaaaccttca atcctcaaaa ttcttcaagc 360
ttccgggaag taggctcgcc tatcaccatc ttctatggat ctgggataat tcagggattt 420
cttggctctg acaccgttcg gatcgggaac cttgttagcc ctgaacagtc gtttggccta 480
agcctggagg aatacgggtt tgattctcta ccctttgatg gtatcctggg cttggctttt 540
cccgccatgg gcatcgaaga taccatcccc atctttgaca acttgtggtc acacggtgcc 600
ttttctgagc ctgtcttcgc cttctacttg aacacaaaca agccagaggg cagtgtggtg 660
atgtttggtg gggtggacca ccgctactac aagggagagc tcaactggat accagtgtcc 720
caaactagcc attggcagat aagcatgaac aacatcagca tgaatgggac tgtgactgct 780
tgttcttgtg gatgtgaggc ccttttggac accgggacat caatgatcta cggcccaaca 840
aaactggtca ccaacatcca caagctcatg aacgccaggc ttgagaattc tgagtatgtg 900
gtttcatgtg atgctgtcaa gaccctgcct cctgtcatct tcaacatcaa tggcatcgac 960
tatccactgc gccctcaagc ctacatcatc aagattcaaa acagctgccg cagcgtcttt 1020
caaggaggca cagaaaatag ctctctaaac acctggatcc ttggtgatat cttcctgagg 1080
cagtacttct cggtttttga tcgtaaaaat agaaggattg gcctggctcc ggcagtgtaa 1140
atgcttggac tatcagcaag catttgacta aatcagtcag gctgctccta acacacactc 1200
gctcacacta ggcactcctg ccagcgatgc tggtgaattg tgtttggtgc tgcaaacc 1258

<210> 3
<211> 1266
<212> DNA
<213> bovidae

<400> 3
ggcttgtgct cctcgggctg gtggccttct cagagtgcat agtcaaaata cctctaagga 60
gagtgaagac catgagaaat accgtcagtg gaaaaaacat actgaacaat atcctgaagg 120
agcatgttta cagactgtcc cagatttctt ttcgtggctc aaatctaact actcacccgc 180
tgagaaacat caaggatttg atatacgtgg gtaacatcac cattggaaca ccccctcagg 240
aattccaggt tgtctttgac acaggctcat ctgacttttg ggtgccctct gacttttgca 300
ctagtcgagc ctgttctaca cacgttaggt tcagacatct tcagtcttcc accttccggc 360
tcaccaataa gaccttcagg atcacctatg gatctgggag aatgaaagga gttgttgctc 420
atgacacagt tcggattggg gaccttgtaa gtactgacca accgtttggt ctaagtgtgg 480
aggaatatgg gtttgagggc agagcttatt atgatggtgt cttgggcttg aactacccca 540
acatatcctt ctctggagcc atccccatct ttgacaacct gaagaatcaa ggtgccattt 600
ctgagcctgt ttttgccatt ctactgagca aagacgagca ggagggcagt gtggtgatgt 660
ttggtggggt ggaccaccgc tactatgagg gagagctcaa ctgggtacca ttgattgaag 720
cgggtgactg gattatacac atggaccgca tctccatgaa aagaaagatt attgcttgtt 780
ctggcagctg cgaggccatt gttgacactg ggacatcagc aatagaaggc ccaagaaaac 840
tggtaaataa gatacacaag ctcatcggcg ccaggccacg gcattccaag tactacattt 900
catgttctgc ggtcaatacc ctgccttcta ttatcttcac catcaacggc atcaactacc 960
catgtccagg tcgagcctac gtgctcaagg attctagagg ccgctgctat tccatgtttc 1020
aagagaacaa agtgagttca tctacagaga cctggatcct gggcgatgtc tttctgaggg 1080
tgtatttctc agtctttgat cgaggaaatg acaggattgg cctggcacga gcagtgtaaa 1140
tgcttggagt ggttcaggaa tcagtaaggc cgctcctaac acacactcac tcacactagg 1200

cactcctgcc caggatggtg gtgaactgta tttggtggtc tgtacaccct attctctcgt 1260
gccgtt 1266

<210> 4
<211> 1359
<212> DNA
<213> bovidae

<400> 4
acaaaaaccc tcagtggaaa aaacatgctg aacaatttcg tgaaggagca tgcttacaga 60
ctgtcccaga tttcttttcg tggctcaaat ctaactattc acccgctgag aaacatcagg 120
gatttttct atgtgggtaa catcaccatt gggacacccc ctcaggaatt ccaggttatc 180
tttgacacag gctcatctga gttgtgggtg ccctccatct tttgcaacag ctcaacctgt 240
tctaaacacg ataggttcag acatcttgag tcttctacct tccggcttag caggaggacc 300
ttcagcatca cctatggatc tgggagaatt gaagcacttg ttgttcatga cacagttcgg 360
attggggacc ttgtaagtac tgatcagcag ttcggtctat gcctagaaga atctgggttt 420
gagggcatga gatttgatgg cgtcttgggc ttgagctata ccaacatatc cccctctgga 480
gccatcccca tcttttacaa gctgaagaat gaaggtgcca tttctgaacc tgtttttgcc 540
ttctacttga gcaaagatga gcgggagggc agtgtggtga tgtttggtgg ggcggaccac 600
cgctactaca agggagagct caactggata ccattgatga aagcaggcga ctggagtgta 660
cacatggacc gcatctccat gaaaagaaag gttattgctt gctctggcgg ctgcaaggcc 720
cttgtggaca cggggtcatc agatatcgta ggcccaagta cactggtcaa taacatctgg 780
aagctcatcg gtgccacgcc acagggttct gagcactacg tttcatgttc tgcggtcaat 840
agcctaccct ctattatctt caccatcaaa agcaacaact accgagtgcc aggtcaagcc 900
tacatcctca aggattctag aggccgctgc tttactgcct ttaaagggca tcaacagagt 960
tcatctacag agatgtggat cctgggtgac gtctttctga ggctgtattt ctcagtcttt 1020
gatcgaagaa aggacagaat tggcctggcc accaaggtgt gaatgcttgg agtggttcag 1080
gaatcagtaa ggccactcct aacacacact cactcacact ttgggcactc ctgcccaagg 1140
aatgctggtg aactgtaatt tggtggtctg tacaccctat tctctgggaa gaaggcaatg 1200
gcaccccact ccagtactct tgcctggaaa atcacatgga cagaagcctg gtgggctcca 1260
gtccatgggg tttctaagag tcgggcaata actgagcacc ttcacttata ctttcacttt 1320
acaccctatt ctcaataaaa gataaatggt ttcactctt 1359

<210> 5
<211> 1317
<212> DNA
<213> bovidae

<400> 5
ccctgagtac ttggagccag gaaagaagta tgaagtggct tgtgctcctt gggctgctga 60
cctcctcaga gtgcatagtc atcctacctc taacaaaagt gaagaccatg agaaaaaccc 120
tcagtgaaaa aaacatgctg aacaatttcc tgaaggaaca ggcttacaga ctgtcccaga 180
tttcttctcg tggctcaaat ataactattc atcccctgag gaacatcatg gatatggtct 240
atgtgggtaa aatcaccatt ggaacacccc ctcaggaatt ccaggttgtc tttgacacag 300
gctcatctga gttgtgggtg ccctccgtct tttgccccag ttcagcctgt tctactcaca 360
ttaggttcag acatcttgag tcttccactt ccggcctaac ccaaaagacc ttcagcatca 420
cctatggatc tgggagcacg aagggatttc ttgcttatga caccgttcgg attggggacc 480
ttctaagtac tgatcaggaa ttcggactaa gcatggaaga acacgggttt gaggatctac 540
cttttgatgg cgtcttgggc ttgaactacc ctgacatgtc cttcataaca accatcccca 600
tctttgacaa cctcaagaat caaggtgcct tttctgagcc tgtttttgcc ttctacttgg 660
gcaaggtgaa gggcagtgtg gtgatgtttg gtggggtgga ccacacctac tacaagggag 720
agctcaactg ggtgccattg atccaggcag gtgagtggag tctacacatg gaccgcatct 780
ccatgaaaag aaaggttatt gcttgttctg gtggctgcga ggccttctat gacactggaa 840
catcactgat ccttggccca agaagactgg tcaataacat ccagaagctc atcggtgcca 900

78

cgccacaggg ttccgagcac tacatttcat gttttgctgt catatccctg ccctctatta 960
tcttcaccat caacggcatc aacatcccag tgccagctcg agcctacatc cacaaggatt 1020
ctagaggcca ctgctatccc acctttaaag agaacacagt gagtacatcc acagagacct 1080
ggatcctggg tgacgtcttc ctgaggctct atttctcagt ttttgatcga ggaaatgaca 1140
ggattggcct ggcacaggtg taaatgcttg gagtggttca ggaatcagta aggccgctcc 1200
taacacacac tcactcacac tttgagactc ctgcccagga tgctggtgaa ctgtatttgg 1260
tggtctgcac accctattct caggaaagaa taaagggttt cactcttaat ggtgctg 1317

<210> 6
<211> 1322
<212> DNA
<213> bovidae

<400> 6
ggagccagaa aatcacatga agtggcttgt gctcctcggg ctggtggcct tctcagagtg 60
catagtcaaa atacctctaa ggagagtgaa gacaatgaga aatgctatca gtggaaaaaa 120
cacgctgaac aatatcctga aggagcatgc ttacagactg ccccagattt cttttcgtgg 180
ctcaaatcta actcacccac tgagaaacat cagggatttg ttctacgtgg gtaacatcac 240
cattgggaca ccccctcagg aattccaggt tatctttgac acaggctcat ctgacttgtg 300
ggtggcctcc atcttttgca acagctcatc ctgtgctgca cacgttaggt tcagacatca 360
tcagtcttcc accttccggc ctaccaataa gaccttcagg atcacctatg gatctgggag 420
aatgaaagga gttgttgttc atgacacagt tcggattggg gaccttgtaa gtactgacca 480
gccattcggt ctatgcctga aagactctgg gtttaagggc atacctttg atggcatctt 540
gggcttgagc taccccaaca aaaccttctc tggagccttc cccatctttg acaagctgaa 600
gaatgaaggt gccatttctg agcctgtttt tgccttctac ttgagcaaag acaagcagga 660
gggcagtgtg gtgatgtttg gtggggtgga ccaccgctac tacaaggggg agctcaactg 720
ggtaccattg atccaagtgg gtgactggtt tgtacacatg gaccgcacta ccatgaaaag 780
aaaggttatt gcttgttctg atggctgcaa ggcccttgtg gacaccggga catcagatat 840
cgtaggccca agtacactgg tcaataacat ctggaagctc atccgtgcca ggccactggg 900
tcctcagtac ttcgtttcat gttctgcggt caatacactg ccctctatta tcttcaccat 960
caacggcatc aactaccgac tgccagctcg agcctacatc cacaaggatt ctagaggccg 1020
ctgctatacc gcctttaaag agcaccgatt cagttcacct atagagacct ggctcctggg 1080
tgacgtcttc ctgaggcggt atttctcagt ctttgatcga ggaaatgaca ggattggcct 1140
ggcacgggca gtgtaaatgc ttagagtggc tcaggaatca gtaaggccgt tcctaacaca 1200
ccttaactca cactttgggc actcttgcct aggatgctgg tgaactgtat ttggtgctcg 1260
tacacccatt ctagtaaaga ataaagggtt tcacttaacg ggtgctgaaa aaaaaaaaaa 1320
aa 1322

<210> 7
<211> 1211
<212> DNA
<213> bovidae

<400> 7
acaccaaaac ttccctgagt acttggaacc aggaaagaag catgaagtgg cttgtgctcc 60
tcgggctggt ggccttctca gagtgcatag tcaaaatacc tctaaggaga gtgaagacca 120
tgagaaaaac tctcagtgga aaaaacatgc tgaacaattt cttgaaggag gatccttaca 180
gactgtccca catttctttt cgtggctcaa atctaactat tcacccgctg agaaacatca 240
gagatatctt ctatgtcgga aacatcacca ttggaacacc ccctcaggaa ttccaggtta 300
tctttgacac aggctcatct gacttgtggg tgccctcgat cgattgcaac agtacatcct 360
gtgctacaca tgttaggttc agacatcttc agtcttccac cttccggcct accaataaga 420
ccttcaggat catctatgga tctgggagaa tgaacggagt tattgcttat gacacagttc 480
ggattgggga ccttgtaagt accgaccagc catttggtct aagcgtggag gaatatgggt 540
ttgcgcacaa aagatttgat ggcatcttgg gcttgaacta ctggaaccta tcctggtcta 600

aggccatgcc catctttgac aagctgaaga atgaaggtgc catttctgag cctgtttttg 660
ccttctactt gagcaacatc accatgaaca gagaggttat tgcttgttct gaaggctgtg 720
cggcccttgt ggacactggg tcatcaaata tccaaggccc aggaagactg attgataaca 780
tacagaggat catcggcgcc acgccacggg gttccaagta ctacgtttca tgttctgcgg 840
tcaatatcct gccctctatt atcttcacca tcaacggcgt caactaccca gtgccacctc 900
gagcttacat cctcaaggat tctagaggcc actgctatac cacctttaaa gagaaaagag 960
tgaggagatc tacagagagc tgggtcctgg gtgaagtctt cctgaggctg tatttctcag 1020
tctttgatcg aggaaatgac aggattggcc tggcacggcg agtgtaaatg cttggtctgg 1080
ctcaagaatc attaaggcca ctcctaacac acactcactc acactttggg cactgctgcc 1140
aggatgctgg tgaactgtat ttgtgttctg tacaccctat tctcagtaaa gaataaaggg 1200
tttcagctct t 1211

<210> 8
<211> 1340
<212> DNA
<213> bovidae

<400> 8
caggaattcg cggccgcgtc gacggaaaga agcatgaagt ggcttgtgct tctcgggctg 60
gtggccctct cagagtgcat agtcaaaatc cctctaacga agatgaagac catgcaagaa 120
gccatcaggg aaaaacaatt gctggaagat ttcttggatg aacaacctca cagcctgtcc 180
cagcattctg atcctgacaa gaaattctct tctcaccaac tgaagaattt ccagaatgct 240
gtctactttg gtacgatcac cattggaaca cctcctcaag agttccaggt caactttgac 300
accggctcat ctgacttgtg ggtgccctct gtcgactgcc aaagtccctc ctgctctaaa 360
cataagagat tcgaccctca gaagtccacc accttccagc ctttgaacca gaaaattgaa 420
ctcgtctacg gctctgggac catgaaaggg gttcttggct ctgacaccat tcagatcggg 480
aaccttgtca tcgtgaacca gatttttggc ttgagccaga atcagtccag tggcgtcctg 540
gaacaagtac cttatgatgg catcctgggc ttggcctacc ccagcctcgc catccagggg 600
accaccccag tcttcgacaa cctgaagaat cgagaagtca tttctgagcc agtctttgcc 660
ttctacttga gctcccggcc agaaaacatc agcacggtga tgtttggcgg ggtggaccac 720
acctaccaca agggaaaact ccagtggatc ccagtgaccc aagcccgctt ctggcaggta 780
gccatgagca gcatgaccat gaacgggaat gtggtcggtt gttcccaagg atgtcaggcc 840
gttgtggata ctgggacctc gttgctggtt gggccaactc acctggtcac tgacatcctg 900
aagctcatca accctaatcc tatcctgaat gacgagcaaa tgctttcatg tgatgccatc 960
aatagcctgc ctacgctcct cctcaccatc aacggcatcg tctaccctgt gccccctgac 1020
tactacatcc agaggttttc tgaaaggatc tgctttatca gctttcaagg gggcacagag 1080
atcttgaaaa atttgggaac ctcggagacc tggatcctgg gtgatgtctt cctgaggctg 1140
tatttttcag tttatgaccg aggaaataac aggattggcc tggctcctgc agcataaatt 1200
cgggctgcta caggaatcaa tcagggccag acaaacacac actcactcac atgcagggcc 1260
atcccaccca gggatgctgg tgaactatgc ctgatgctct gcaaagccgt attctcagta 1320
aagaataaaa gattcatttc 1340

<210> 9
<211> 1311
<212> DNA
<213> bovidae

<400> 9
accccaaact tccctgagta cctggagcca gtaaagaagc atgaagtgga ttgtgctcct 60
cgggctggtg gccttctcag agtgcatagt caaaatacct ctaaggcaag tgaagaccat 120
gagaaaaacc ctcagtggaa aaaacatgct gaagaatttc ttgaaggagc atccttacag 180
actgtcccag atttcttttc gtggctcaaa tctaactatt cacccgctga ggaacatcat 240
gaatttggtc tacgtgggta acatcaccat tggaacaccc cctcaggaat tccaggttgt 300
ctttgacaca ggctcatctg acttgtgggt gccctccttt tgtaccatgc cagcatgctc 360

80

tgcaccggtt tggttcagac aacttcagtc ttccaccttc cagcctacca ataagacctt 420
caccatcacc tatggatctg ggagcatgaa gggatttctt gcttatgaca cagttcggat 480
tggggacctt gtaagtactg atcagccgtt cggtctaagc gtggtggaat atgggttgga 540
gggcagaaat tatgatggtg tcttgggctt gaactacccc aacatatcct tctctggagc 600
catccccatc tttgacaacc tgaagaatca aggtgccatt tctgagcctg tttttgcctt 660
ctacttgagc aaaaacaagc aggagggcag tgtggtgatg tttggtgggg tggaccacca 720
gtactacaag ggagagctca actggatacc actgattgaa gcaggcgaat ggagagtaca 780
catggaccgc atctccatga aaagaacggt tattgcttgt tctgatggct gtgaggccct 840
tgtgcacact gggacatcac atatcgaagg cccaggaaga ctggtgaata acatacacag 900
gctcatccgc accaggccat ttgattccaa gcactacgtt tcatgttttg ccaccaaata 960
cctgccctct attactttca tcatcaacgg catcaagtac ccaatgacag ctcgagccta 1020
catctttaag gattctagag gccgctgcta ttccgctttt aaagagaaca cagtgagaac 1080
atctagagag acctggatcc tcggtgatgc cttcctgagg cggtatttct cagtctttga 1140
tcgaggaaat gacaggattg gcctggcacg ggcagtgtaa atgcttagag tggttcagga 1200
atcagtaagg ccgttcctaa cacacactaa ctcacacttt gggcactctt gcctaggatg 1260
ctggtgaacc tgtctttggt ggtcttgtac caccctattc tcagtaaaga a 1311

<210> 10
<211> 1328
<212> DNA
<213> bovidae

<400> 10
tccgactctg tcttgagcac ttcagtggag gacaaaagca tgaagtggct tggacttctc 60
gggctggtag ctctctcaga gtgcatggtc ataatccctc ttaggcaaat gaagaccatg 120
cgagaaaccc taagggaaag acatttgctg acaaatttct ctgaggaaca cccttacaac 180
ctgtcccaga aagctgctaa tgatcaaaac ataatttatc atcatccctt gaggagctat 240
aaggattttt cctacatcgg caacatcaac attggaacac cccctcagga gttccaggtc 300
ctctttgaca ccggctcatc tagcttgtgg gtgccctcca tatactgcca gagttccagc 360
tgctataaac acaatagctt cgtccccttgt aactcctcca ccttcaaggc cacgaacaag 420
atcttcaata ccaactacac cgctacatcg ataaagggat atcttgtcta tgacactgtt 480
cggatcggga accttgttag tgtggcccag ccatttggcc taagcctgaa ggagtttggg 540
tttgacgatg taccatttga tggcatcctg ggactaggtt acccacgccg cactatcaca 600
ggggccaacc cgatcttcga caacctgtgg aaacaaggag tcatttctga gcctgtcttt 660
gccttctact tgagcagtca gaaagagaac ggcagcgtgg tgatgtttgg aggggtgaac 720
cgtgcctact ataagggaga actcaactgg gtaccagtgt cccaagtggg cagctggcat 780
ataaacatag acagcatctc catgaatggg acagtggttg cttgtaaacg tggctgccag 840
gcctcttgga tacggggacg cctttctgcg tggcccaaga ggatcgtcag caaaatccag 900
aaactcatcc atgccaggcc catcgatcgt gagcacgtgg tttcctgcca agccatcggg 960
acactgcctc ctgctgtctt cactatcaat gggatagact atccagtacc cgcccaagct 1020
tacatccaaa gtttgtcggg ctactgcttc agcaactttc ttgtgcgccc acagcgtgtg 1080
aacgagtcgg agacctggat cctgggtgac gtcttcctga ggctgtattt ctcagttttc 1140
gatcgaggaa acaacaggat tggcctggct cccgcagtgt aaatgctggg ctacttcagg 1200
aatcaatcag gcccactcca aacacatact catgtgaggg caccctgggt ggggccaggg 1260
atgctggtga actctgtttg ttgcgctgca aagccctact ctctatagag aataaaggat 1320
ttcatctc 1328

<210> 11
<211> 1285
<212> DNA
<213> bovidae

<400> 11
gagatgaagt ggcttgtgtt ccttgggctg gtggccttct cagagtgcat agtcataatg 60

81

cttctaacta aaacgaagac aatgcgagaa atctggaggg aaaaaaaatt gctgaacagt 120
ttcctggagg aacaagccaa tagaatgtcc gatgattctg ctagtgaccc caaattatct 180
actcaccccc tgaggaacgc tctggatatg gcctatgtgg gtaacatcac cattggaaca 240
ccccctaagg agttccgggt tgtctttgac acgggctcat ctgacttgtg ggtgccctcc 300
atcaagtgca tcagtcctgc ctgtcataca catattacct tcgaccatca caaatcttcc 360
accttccggc ttacgcgcag gcccttccac atcctctacg gatctgggat gatgaacgga 420
gttcttgcct atgacactgt tcggatcggg aaacttgtca gcactgacca gccgtttggc 480
ctaagcctgc agcaattcgg gtttgataat gcacccttg atggtgtcct gggcttgtcc 540
taccccagcc tcgctgtccc aggaaccatc cccatctttg acaagctgaa gcaacaaggt 600
gccatttctg aacctatctt tgccttctac ttgagcaccc gcaaggagaa tggcagtgtg 660
ttgatgttag gtggggtgga ccactcctac cacaagggaa agctcaactg gataccagtg 720
tcccaaacca aaagctggct aataactgtg gaccgcatct ccatgaatgg gagagtgatt 780
ggctgtgaac acggctgcga ggctcttgtg gataccggga catcactgat ccatggccca 840
gcaagaccag tcaccaacat ccaaaagttc atccacgcta tgccctacgg ttccgagtac 900
atggttttgt gtcctgtcat cagtatcctg cctcctgtca tcttcaccat caatggcatc 960
gattactcag tgcctcgtga agcctacatc caaaagattt ctaatagctt atgccttagc 1020
acctttcatg gggacgacac agaccaatgg atcctgggtg acgtcttcct gaggctgtat 1080
ttctcagttt atgaccgagg aaataacagg attggcctgg ctcctgctgt gtaaatgctt 1140
ggacttgttc aggaatcatt caggccagtc ctaacacaca cttgctcaca ctttagactc 1200
ctgcccagga tgctggtaaa ctgtgtttgg tgctctgaaa gtcatattct cactgaaaaa 1260
taaaaggttt cactcttaac atctt 1285

<210> 12
<211> 1130
<212> DNA
<213> bovidae

<400> 12
atgaagtggc ttgtgctcct cgggctggtg gccctctcag agtgcatagt cattttgcct 60
ctaaggaaaa tgaagacctt gcgagaaacc ctgagggaaa aaaacttgct gaacaatttc 120
ctggaagaac gagcttacag actgtccaag aaagactcca aaataactat tcacccccct 180
aaaactatct ggatatggcc tacgtgggta atatcaccat tggaacaccc cctcaggaat 240
tccgggtcgt ctttgacaca ggctcagctg acttgtgggt gccttccatc agctgtgtca 300
gtccagcctg ttatacacac aaaaccttca atcttcacaa ttcttccagc ttcgggcaaa 360
cacaccagcc tattagcatc tcctatggac ctgggataat tcagggattt cttggctctg 420
acaccgttcg gatcgggaac cttgttagcc ttaaacagtc gtttggccta agccaggagg 480
aatatgggtt tgatggtgca ccctttgatg gcgtcctggg cttggcctac ccctccatca 540
gcatcaaagg tatcatcccc atctttgaca acttgtggtc gcaaggtgcc ttttctgaac 600
ctgtctttgc cttctacttg aacacatgcc agccggaagg cagtgtggtg atgtttggtg 660
gagtggacca ccgctactac aagggagagc tcaactggat accagtgtcc caaactcgct 720
actggcagat aagcatgaac cgcatcagca tgaacgggaa tgttactgct tgttctcgtg 780
gatgtcaggc ccttttggac accgggacat caatgatcca tggcccaaca agactgatca 840
ccaacatcca caagctcatg aacgccaggc accagggttc ggagtatgtg gtttcatgtg 900
atgccgtcaa gaccctgcct cctgtcatct tcaacatcaa tggcatcgac tatccactgc 960
cccctcaagc ctacatcacc aaggctcaaa acttctgcct tagcatcttt catgggggca 1020
cagaaactag ctctccagag acctggatcc tgggtggcgt cttcctgaga cagtacttct 1080
cagtttttga tcgaagaaat gacagtattg gcctggcaca ggtgtaaatg 1130

<210> 13
<211> 1173
<212> DNA
<213> bovidae

<400> 13
cccaagctta tgaagtggct tgtgctcctc gggctggtgg ccctctcaga gtgcatagtc 60
attttgcctc taaagaaaat gaagaccttg cgagaaaccc tgagggaaaa aaacttgctg 120
aacaatttcc tggaggaaca agcttacaga ctgtccaaga atgactccaa aataactatt 180
caccccctga ggaactatct ggatactgcc tacgtgggta acatcaccat tggaacaccc 240
cctcaggagt tccgggtcgt ctttgacaca ggctcagcta acttgtgggt gccctgcatc 300
acctgtacca gtccagcctg ttatacacac aaaaccttca atcctcaaaa ttcttcaagc 360
ttccgggaag taggctcgcc tatcaccatc ttctatggat ctgggataat tcagggattt 420
cttggctctg acaccgttcg gatcgggaac cttgttagcc ttaaacagtc gtttggccta 480
agccaggagg aatatgggtt tgatggtgca ccctttgatg gcgtcctggg cttggcctac 540
ccctccatca gcatcaaagg tatcatcccc atctttgaca acttgtggtc gcacggtgcc 600
ttttctgagc ctgtcttcgc cttctacttg aacacaaaca agccagaggg cagtgtggtg 660
atgtttggtg gggtggacca ccgctactac aagggagagc tcaactggat accagtgtcc 720
caaactagcc attggcagat aagcatgaac aacatcagca tgaatgggac tgtgacggct 780
tgttcttgtg gatgtgaggc ccttttggac accgggacat caatgatcta cggcccaaca 840
aaactggtca ccaacatcca caagctcatg aacgccaggc ttgagaattc tgagtatgtg 900
gtttcatgtg atgctgtcaa gaccctgcct cctgtcatct tcaacatcaa tggcatcgac 960
tatccactgc gccctcaagc ctacatcatc aagattcaaa acaactgccg cagcgtcttt 1020
caaggaggca cagaaaatag ctctctaaac acctggatcc ttggtgatat cttcctgagg 1080
cagtacttct cggtttttga tcgtaaaaat agaaggattt gctggcacag gtgggtaccg 1140
actacaagga cgacgatgac aagtaagctt ccg 1173

<210> 14
<211> 1176
<212> DNA
<213> bovidae

<400> 14
cccaagctta tgaagtggct tgtgctcctt gcgctggtgg ccttctcaga gtgcataatc 60
aaaatacctc taaggagagt gaagaccatg agcaataccg ccagtggaaa aaacatgctg 120
aacaatttcc tgaagaagca tccttacaga ttgtcccaga tttcttttcg tggctcaaat 180
ctcactactc acccactgat gaacatctgg gatttgctct acctgggtaa catcaccatt 240
ggaacacccc ctcaggaatt ccaggttctc tttgacacag gctcatctga cttgtgggtc 300
ccctctctct tgtgcaacag ctcaacctgt gctaaacacg ttatgttcag acatcgtctg 360
tcttccacct accggcctac caataagacc ttcatgatct tctatgcagt tgggaaaatt 420
gaaggagttg ttgttcgtga cacagttcgg attggggacc ttgtaagtgc ggaccagacg 480
tttggtctaa gcattgcaga aactgggttt gagaacacaa ctcttgatgg catcttgggc 540
ttgagctacc ccaacacatc ctgctttgga accatcccca tctttgacaa gctgaagaat 600
gaaggtgcca tttctgagcc tgtactacat agtgtgagac gcaaagatga gcaggagggc 660
agtgtagtga tgtttggtgg tgtggaccac agttactaca agggagagct caactgggta 720
ccattgatca aagcaggcga ctggagtgta cgtgtggaca gcatcaccat gaaaagagag 780
gttattgctt gttctgacgg ctgcagggcc ctggtggaca ccggttcatc acatatccaa 840
ggcccaggaa gactgatcga taacgtacag aagctgatag gcaccatgcc acagggatcc 900
atgcactatg ttccatgttc tgcggtcaat accctgccct ctattatctt caccatcaac 960
agcatcagct acacagtgcc agctcaagcc tacatcctca agggttctag gggccgctgc 1020
tattccacct ttcaagggca cactatgagt tcatctacag agacctggat cctgggtgat 1080
gtcttcctga gtcagtattt ctcggtcttt gatcgaggaa atgacaggat tggcctggca 1140
caggtgggta ccgactacaa ggacgacgat gaaagt 1176

<210> 15
<211> 1360
<212> DNA
<213> Felis domestica

<400> 15
aggaaagaag catgaagtgg ctttgggtcc ttgggctggt ggccctctca gagtgcttag 60
tcacaatccc tctgacgagg gtcaagtcca tgcgagaaaa cctcagggag aaagacaggc 120
tgaaggattt cctggagaac catccttaca acctggccta caagtttgtt gactctgtaa 180
atctggacct ggggatatat tttgaaccga tgaggaacta cctggatctg gcctacgttg 240
gcaccatcag cattggaacg ccccccccagg agttcaaggt catctttgac accggctcat 300
ctgacttgtg ggtgccctcc atctactgct ctagccctgc ctgcgctaat cacaacgtct 360
tcaaccctct gcggtcctcc accttccgga tctcgggccg gcccatccac ctccagtacg 420
gctccgggac gatgtcagga tttctggcct acgacaccgt tcggttcggg ggcctcgttg 480
acgtggccca ggcgtttggc ctgagcctga gggagcccgg caagttcatg gaatacgcag 540
ttttcgacgg catcctgggc ctggcctacc ccagcctcag cctcagaggg accgtccctg 600
tcttcgacaa cctgtggaag cagggtctca tttctcagga gctctttgcc ttctacttga 660
gcaaaaagga cgaagaaggc agtgtggtga tgttcggcgg tgtggaccac tcctactaca 720
gcggagacct caactgggtg ccggtgtcca aacggctgta ctggcagtta tccatggaca 780
gcatctccat gaacggggaa gtcattgctt gtgacggtgg ctgccaggcc atcattgata 840
caggaacctc gctgctgatt ggcccatctc acgttgtctt caacatccag atgatcatcg 900
gcgccaacca gtcctacagc ggcgagtacg tagttgactg cgatgccgcc aacaccctgc 960
ccgacatcgt cttcaccatc aacggcatcg actacccggt gccagccagt gcctacatcc 1020
aggagggtcc tcagggcacc tgctacagcg gctttgacga gagcggagac agcttgttgg 1080
tctcagactc ctggatcctg ggcgatgtct tcctgaggtt gtatttcacc gtcttcgacc 1140
gagagaacaa caggattggc ctggccctgg cagtgtaaac actggggcca gctccaggaa 1200
gcaaccgtgc ccaccccaaa cccgcgcgcg cgtgtgcgca cacacacaca cacacacccc 1260
gcagtcaggg cattcctgcc caggggccgg cttgaactgt gtcttcggct ctgccaatcc 1320
cttctcccag tggagaataa aagacctcat cttccacggt 1360

<210> 16
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR primer

<400> 16
cccaagctta tgaagtggct tgtgctcct 29

<210> 17
<211> 69
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR primer

<400> 17
gggaagctta cttgtcatcg tcgtccttgt agtcggtacc cacctgtgcc aggccaatcc 60
tgtcatttc 69

<210> 18
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR primer

<400> 18
cctcttttgc cttctacttg a 21

<210> 19
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR primer

<400> 19
gcgctcgagt tacactgccc gtgccaggc 29

<210> 20
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR primer

<400> 20
tgggtaacat caccattgga a 21

<210> 21
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR primer

<400> 21
tttctgagcc tgtttttgcc 20

<210> 22
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR primer

<400> 22
tgggtaacat caccattgga ac 22

<210> 23
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR primer

<400> 23
caaacatcac cacactgccc tcc 23

<210> 24
<211> 380
<212> PRT
<213> bovidae

<400> 24
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Leu Lys Thr Met Arg Asn Val Val Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu His Ala Tyr Ser Leu
35 40 45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Thr His Pro Leu Arg
50 55 60

Asn Ile Lys Asp Leu Val Tyr Met Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Ala Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Asp Phe Cys Thr Ser Pro Ala Cys Ser Thr His Val Arg
100 105 110

Phe Arg His Leu Gln Ser Ser Thr Phe Arg Leu Thr Asn Lys Thr Phe
115 120 125

Arg Ile Thr Tyr Gly Ser Gly Arg Met Lys Gly Val Val Val His Asp
130 135 140

Thr Val Arg Ile Gly Asn Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145 150 155 160

Ser Ile Glu Glu Tyr Gly Phe Glu Gly Arg Ile Tyr Asp Gly Val Leu
165 170 175

Gly Leu Asn Tyr Pro Asn Ile Ser Phe Ser Gly Ala Ile Pro Ile Phe
180 185 190

Asp Lys Leu Lys Asn Gln Arg Ala Ile Ser Glu Pro Val Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Asp Glu Arg Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

```
Val Asp His Arg Tyr Tyr Glu Gly Glu Leu Asn Trp Val Pro Leu Ile
225                 230                 235                 240

Gln Ala Gly Asp Trp Ser Val His Met Asp Arg Ile Ser Ile Glu Arg
                245                 250                 255

Lys Ile Ile Ala Cys Ser Asp Gly Cys Lys Ala Leu Val Asp Thr Gly
            260                 265                 270

Thr Ser Asp Ile Val Gly Pro Arg Arg Leu Val Asn Asn Ile His Arg
        275                 280                 285

Leu Ile Gly Ala Ile Pro Arg Gly Ser Glu His Tyr Val Pro Cys Ser
    290                 295                 300

Glu Val Asn Thr Leu Pro Ser Ile Val Phe Thr Ile Asn Gly Ile Asn
305                 310                 315                 320

Tyr Pro Val Pro Gly Arg Ala Tyr Ile Leu Lys Asp Asp Arg Gly Arg
                325                 330                 335

Cys Tyr Thr Thr Phe Gln Glu Asn Arg Val Ser Ser Ser Thr Glu Thr
            340                 345                 350

Trp Tyr Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
        355                 360                 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
    370                 375                 380

<210> 25
<211> 376
<212> PRT
<213> bovidae

<400> 25
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Leu Ser Glu Cys Ile
  1               5                  10                  15

Val Ile Leu Pro Leu Lys Lys Met Lys Thr Leu Arg Glu Thr Leu Arg
            20                  25                  30

Glu Lys Asn Leu Leu Asn Asn Phe Leu Glu Glu Gln Ala Tyr Arg Leu
        35                  40                  45

Ser Lys Asn Asp Ser Lys Ile Thr Ile His Pro Leu Arg Asn Tyr Leu
    50                  55                  60

Asp Thr Ala Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro Pro Gln Glu
65                  70                  75                  80

Phe Arg Val Val Phe Asp Thr Gly Ser Ala Asn Leu Trp Val Pro Cys
                85                  90                  95
```


87

```
Ile Thr Cys Thr Ser Pro Ala Cys Tyr Thr His Lys Thr Phe Asn Pro
            100                 105                 110

Gln Asn Ser Ser Ser Phe Arg Glu Val Gly Ser Pro Ile Thr Ile Phe
        115                 120                 125

Tyr Gly Ser Gly Ile Ile Gln Gly Phe Leu Gly Ser Asp Thr Val Arg
    130                 135                 140

Ile Gly Asn Leu Val Ser Pro Glu Gln Ser Phe Gly Leu Ser Leu Glu
145                 150                 155                 160

Glu Tyr Gly Phe Asp Ser Leu Pro Phe Asp Gly Ile Leu Gly Leu Ala
                165                 170                 175

Phe Pro Ala Met Gly Ile Glu Asp Thr Ile Pro Ile Phe Asp Asn Leu
            180                 185                 190

Trp Ser His Gly Ala Phe Ser Glu Pro Val Phe Ala Phe Tyr Leu Asn
        195                 200                 205

Thr Asn Lys Pro Glu Gly Ser Val Val Met Phe Gly Gly Val Asp His
    210                 215                 220

Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Val Ser Gln Thr Ser
225                 230                 235                 240

His Trp Gln Ile Ser Met Asn Asn Ile Ser Met Asn Gly Thr Val Thr
                245                 250                 255

Ala Cys Ser Cys Gly Cys Glu Ala Leu Leu Asp Thr Gly Thr Ser Met
            260                 265                 270

Ile Tyr Gly Pro Thr Lys Leu Val Thr Asn Ile His Lys Leu Met Asn
        275                 280                 285

Ala Arg Leu Glu Asn Ser Glu Tyr Val Val Ser Cys Asp Ala Val Lys
    290                 295                 300

Thr Leu Pro Pro Val Ile Phe Asn Ile Asn Gly Ile Asp Tyr Pro Leu
305                 310                 315                 320

Arg Pro Gln Ala Tyr Ile Ile Lys Ile Gln Asn Ser Cys Arg Ser Val
                325                 330                 335

Phe Gln Gly Gly Thr Glu Asn Ser Ser Leu Asn Thr Trp Ile Leu Gly
            340                 345                 350

Asp Ile Phe Leu Arg Gln Tyr Phe Ser Val Phe Asp Arg Lys Asn Arg
        355                 360                 365

Arg Ile Gly Leu Ala Pro Ala Val
    370                 375
```


55

<210> 26
<211> 381
<212> PRT
<213> bovidae

<400> 26

```
Met Asp Asp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
  1               5                  10                  15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Asn Thr Val Ser
             20                  25                  30

Gly Lys Asn Ile Leu Asn Asn Ile Leu Lys Glu His Val Tyr Arg Leu
         35                  40                  45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Thr His Pro Leu Arg
     50                  55                  60

Asn Ile Lys Asp Leu Ile Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
 65                  70                  75                  80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Asp Phe Trp
                 85                  90                  95

Val Pro Ser Asp Phe Cys Thr Ser Arg Ala Cys Ser Thr His Val Arg
            100                 105                 110

Phe Arg His Leu Gln Ser Ser Thr Phe Arg Leu Thr Asn Lys Thr Phe
        115                 120                 125

Arg Ile Thr Tyr Gly Ser Gly Arg Met Lys Gly Val Val Ala His Asp
    130                 135                 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145                 150                 155                 160

Ser Val Glu Glu Tyr Gly Phe Glu Gly Arg Ala Tyr Tyr Asp Gly Val
                165                 170                 175

Leu Gly Leu Asn Tyr Pro Asn Ile Ser Phe Ser Gly Ala Ile Pro Ile
            180                 185                 190

Phe Asp Asn Leu Lys Asn Gln Gly Ala Ile Ser Glu Pro Val Phe Ala
        195                 200                 205

Ile Leu Leu Ser Lys Asp Glu Gln Glu Gly Ser Val Val Met Phe Gly
    210                 215                 220

Gly Val Asp His Arg Tyr Tyr Glu Gly Glu Leu Asn Trp Val Pro Leu
225                 230                 235                 240

Ile Glu Ala Gly Asp Trp Ile Ile His Met Asp Arg Ile Ser Met Lys
                245                 250                 255
```


89

```
Arg Lys Ile Ile Ala Cys Ser Gly Ser Cys Glu Ala Ile Val Asp Thr
            260                 265                 270

Gly Thr Ser Ala Ile Glu Gly Pro Arg Lys Leu Val Asn Lys Ile His
        275                 280                 285

Lys Leu Ile Gly Ala Arg Pro Arg His Ser Lys Tyr Tyr Ile Ser Cys
    290                 295                 300

Ser Ala Val Asn Thr Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Ile
305                 310                 315                 320

Asn Tyr Pro Cys Pro Gly Arg Ala Tyr Val Leu Lys Asp Ser Arg Gly
                325                 330                 335

Arg Cys Tyr Ser Met Phe Gln Glu Asn Lys Val Ser Ser Ser Thr Glu
            340                 345                 350

Thr Trp Ile Leu Gly Asp Val Phe Leu Arg Val Tyr Phe Ser Val Phe
        355                 360                 365

Asp Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
    370                 375                 380

<210> 27
<211> 380
<212> PRT
<213> bovidae

<400> 27
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
  1               5                  10                  15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Thr Lys Thr Leu Ser
             20                  25                  30

Gly Lys Asn Met Leu Asn Asn Phe Val Lys Glu His Ala Tyr Arg Leu
         35                  40                  45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Ile His Pro Leu Arg
     50                  55                  60

Asn Ile Arg Asp Phe Phe Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
 65                  70                  75                  80

Pro Gln Glu Phe Gln Val Ile Phe Asp Thr Gly Ser Ser Glu Leu Trp
                85                  90                  95

Val Pro Ser Ile Phe Cys Asn Ser Ser Thr Cys Ser Lys His Asp Arg
            100                 105                 110

Phe Arg His Leu Glu Ser Ser Thr Phe Arg Leu Ser Arg Arg Thr Phe
        115                 120                 125
```

```
Ser Ile Thr Tyr Gly Ser Gly Arg Ile Glu Ala Leu Val Val His Asp
    130                 135                 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Gln Phe Gly Leu
145                 150                 155                 160

Cys Leu Glu Glu Ser Gly Phe Glu Gly Met Arg Phe Asp Gly Val Leu
                165                 170                 175

Gly Leu Ser Tyr Thr Asn Ile Ser Pro Ser Gly Ala Ile Pro Ile Phe
            180                 185                 190

Tyr Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
        195                 200                 205

Tyr Leu Ser Lys Asp Glu Arg Glu Gly Ser Val Val Met Phe Gly Gly
    210                 215                 220

Ala Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Leu Met
225                 230                 235                 240

Lys Ala Gly Asp Trp Ser Val His Met Asp Arg Ile Ser Met Lys Arg
                245                 250                 255

Lys Val Ile Ala Cys Ser Gly Gly Cys Lys Ala Leu Val Asp Thr Gly
            260                 265                 270

Ser Ser Asp Ile Val Gly Pro Ser Thr Leu Val Asn Asn Ile Trp Lys
        275                 280                 285

Leu Ile Gly Ala Thr Pro Gln Gly Ser Glu His Tyr Val Ser Cys Ser
    290                 295                 300

Ala Val Asn Ser Leu Pro Ser Ile Ile Phe Thr Ile Lys Ser Asn Asn
305                 310                 315                 320

Tyr Arg Val Pro Gly Gln Ala Tyr Ile Leu Lys Asp Ser Arg Gly Arg
                325                 330                 335

Cys Phe Thr Ala Phe Lys Gly His Gln Gln Ser Ser Ser Thr Glu Met
            340                 345                 350

Trp Ile Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
        355                 360                 365

Arg Arg Lys Asp Arg Ile Gly Leu Ala Thr Lys Val
    370                 375                 380
```

<210> 28
<211> 377
<212> PRT
<213> bovidae

<400> 28

```
Met Lys Trp Leu Val Leu Leu Gly Leu Leu Thr Ser Ser Glu Cys Ile
  1               5                  10                  15

Val Ile Leu Pro Leu Thr Lys Val Lys Thr Met Arg Lys Thr Leu Ser
             20                  25                  30

Glu Lys Asn Met Leu Asn Asn Phe Leu Lys Glu Gln Ala Tyr Arg Leu
         35                  40                  45

Ser Gln Ile Ser Ser Arg Gly Ser Asn Ile Thr Ile His Pro Leu Arg
     50                  55                  60

Asn Ile Met Asp Met Val Tyr Val Gly Lys Ile Thr Ile Gly Thr Pro
 65                  70                  75                  80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Glu Leu Trp
                 85                  90                  95

Val Pro Ser Val Phe Cys Pro Ser Ser Ala Cys Ser Thr His Ile Arg
            100                 105                 110

Phe Arg His Leu Glu Ser Ser Thr Ser Gly Leu Thr Gln Lys Thr Phe
        115                 120                 125

Ser Ile Thr Tyr Gly Ser Gly Ser Thr Lys Gly Phe Leu Ala Tyr Asp
    130                 135                 140

Thr Val Arg Ile Gly Asp Leu Leu Ser Thr Asp Gln Glu Phe Gly Leu
145                 150                 155                 160

Ser Met Glu Glu His Gly Phe Glu Asp Leu Pro Phe Asp Gly Val Leu
                165                 170                 175

Gly Leu Asn Tyr Pro Asp Met Ser Phe Ile Thr Thr Ile Pro Ile Phe
            180                 185                 190

Asp Asn Leu Lys Asn Gln Gly Ala Phe Ser Glu Pro Val Phe Ala Phe
        195                 200                 205

Tyr Leu Gly Lys Val Lys Gly Ser Val Val Met Phe Gly Gly Val Asp
    210                 215                 220

His Thr Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile Gln Ala
225                 230                 235                 240

Gly Glu Trp Ser Leu His Met Asp Arg Ile Ser Met Lys Arg Lys Val
                245                 250                 255

Ile Ala Cys Ser Gly Gly Cys Glu Ala Phe Tyr Asp Thr Gly Thr Ser
            260                 265                 270

Leu Ile Leu Gly Pro Arg Arg Leu Val Asn Asn Ile Gln Lys Leu Ile
        275                 280                 285
```

```
Gly Ala Thr Pro Gln Gly Ser Glu His Tyr Ile Ser Cys Phe Ala Val
    290                 295                 300

Ile Ser Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Ile Asn Ile Pro
305                 310                 315                 320

Val Pro Ala Arg Ala Tyr Ile His Lys Asp Ser Arg Gly His Cys Tyr
                325                 330                 335

Pro Thr Phe Lys Glu Asn Thr Val Ser Thr Ser Thr Glu Thr Trp Ile
            340                 345                 350

Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp Arg Gly
        355                 360                 365

Asn Asp Arg Ile Gly Leu Ala Gln Val
    370                 375
```

<210> 29
<211> 379
<212> PRT
<213> bovidae

<400> 29

```
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
  1               5                  10                  15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Asn Ala Ile Ser
             20                  25                  30

Gly Lys Asn Thr Leu Asn Asn Ile Leu Lys Glu His Ala Tyr Arg Leu
         35                  40                  45

Pro Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr His Pro Leu Arg Asn
     50                  55                  60

Ile Arg Asp Leu Phe Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro Pro
 65                  70                  75                  80

Gln Glu Phe Gln Val Ile Phe Asp Thr Gly Ser Ser Asp Leu Trp Val
                 85                  90                  95

Ala Ser Ile Phe Cys Asn Ser Ser Ser Cys Ala Ala His Val Arg Phe
            100                 105                 110

Arg His His Gln Ser Ser Thr Phe Arg Pro Thr Asn Lys Thr Phe Arg
        115                 120                 125

Ile Thr Tyr Gly Ser Gly Arg Met Lys Gly Val Val Val His Asp Thr
    130                 135                 140

Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu Cys
145                 150                 155                 160
```

```
Leu Lys Asp Ser Gly Phe Lys Gly Ile Pro Phe Asp Gly Ile Leu Gly
                165                 170                 175

Leu Ser Tyr Pro Asn Lys Thr Phe Ser Gly Ala Phe Pro Ile Phe Asp
            180                 185                 190

Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Phe Ala Phe Tyr
        195                 200                 205

Leu Ser Lys Asp Lys Gln Glu Gly Ser Val Val Met Phe Gly Gly Val
    210                 215                 220

Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile Gln
225                 230                 235                 240

Val Gly Asp Trp Phe Val His Met Asp Arg Thr Thr Met Lys Arg Lys
                245                 250                 255

Val Ile Ala Cys Ser Asp Gly Cys Lys Ala Leu Val Asp Thr Gly Thr
            260                 265                 270

Ser Asp Ile Val Gly Pro Ser Thr Leu Val Asn Asn Ile Trp Lys Leu
        275                 280                 285

Ile Arg Ala Arg Pro Leu Gly Pro Gln Tyr Phe Val Ser Cys Ser Ala
    290                 295                 300

Val Asn Thr Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Ile Asn Tyr
305                 310                 315                 320

Arg Leu Pro Ala Arg Ala Tyr Ile His Lys Asp Ser Arg Gly Arg Cys
                325                 330                 335

Tyr Thr Ala Phe Lys Glu His Arg Phe Ser Ser Pro Ile Glu Thr Trp
            340                 345                 350

Leu Leu Gly Asp Val Phe Leu Arg Arg Tyr Phe Ser Val Phe Asp Arg
        355                 360                 365

Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
    370                 375

<210> 30
<211> 341
<212> PRT
<213> bovidae

<400> 30
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
  1               5                  10                  15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Thr Leu Ser
             20                  25                  30
```

```
Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu Asp Pro Tyr Arg Leu
         35                  40                  45

Ser His Ile Ser Phe Arg Gly Ser Asn Leu Thr Ile His Pro Leu Arg
     50                  55                  60

Asn Ile Arg Asp Ile Phe Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
 65                  70                  75                  80

Pro Gln Glu Phe Gln Val Ile Phe Asp Thr Gly Ser Ser Asp Leu Trp
                 85                  90                  95

Val Pro Ser Ile Asp Cys Asn Ser Thr Ser Cys Ala Thr His Val Arg
            100                 105                 110

Phe Arg His Leu Gln Ser Ser Thr Phe Arg Pro Thr Asn Lys Thr Phe
        115                 120                 125

Arg Ile Ile Tyr Gly Ser Gly Arg Met Asn Gly Val Ile Ala Tyr Asp
    130                 135                 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145                 150                 155                 160

Ser Val Glu Glu Tyr Gly Phe Ala His Lys Arg Phe Asp Gly Ile Leu
                165                 170                 175

Gly Leu Asn Tyr Trp Asn Leu Ser Trp Ser Lys Ala Met Pro Ile Phe
            180                 185                 190

Asp Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
        195                 200                 205

Tyr Leu Ser Asn Ile Thr Met Asn Arg Glu Val Ile Ala Cys Ser Glu
    210                 215                 220

Gly Cys Ala Ala Leu Val Asp Thr Gly Ser Ser Asn Ile Gln Gly Pro
225                 230                 235                 240

Gly Arg Leu Ile Asp Asn Ile Gln Arg Ile Ile Gly Ala Thr Pro Arg
                245                 250                 255

Gly Ser Lys Tyr Tyr Val Ser Cys Ser Ala Val Asn Ile Leu Pro Ser
            260                 265                 270

Ile Ile Phe Thr Ile Asn Gly Val Asn Tyr Pro Val Pro Pro Arg Ala
        275                 280                 285

Tyr Ile Leu Lys Asp Ser Arg Gly His Cys Tyr Thr Thr Phe Lys Glu
    290                 295                 300

Lys Arg Val Arg Arg Ser Thr Glu Ser Trp Val Leu Gly Glu Val Phe
305                 310                 315                 320
```

Leu Arg Leu Tyr Phe Ser Val Phe Asp Arg Gly Asn Asp Arg Ile Gly
325 330 335

Leu Ala Arg Arg Val
340

<210> 31
<211> 387
<212> PRT
<213> bovidae

<400> 31
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Leu Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Thr Lys Met Lys Thr Met Gln Glu Ala Ile Arg
20 25 30

Glu Lys Gln Leu Leu Glu Asp Phe Leu Asp Glu Gln Pro His Ser Leu
35 40 45

Ser Gln His Ser Asp Pro Asp Lys Lys Phe Ser Ser His Gln Leu Lys
50 55 60

Asn Phe Gln Asn Ala Val Tyr Phe Gly Thr Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Asn Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Val Asp Cys Gln Ser Pro Ser Cys Ser Lys His Lys Arg
100 105 110

Phe Asp Pro Gln Lys Ser Thr Thr Phe Gln Pro Leu Asn Gln Lys Ile
115 120 125

Glu Leu Val Tyr Gly Ser Gly Thr Met Lys Gly Val Leu Gly Ser Asp
130 135 140

Thr Ile Gln Ile Gly Asn Leu Val Ile Val Asn Gln Ile Phe Gly Leu
145 150 155 160

Ser Gln Asn Gln Ser Ser Gly Val Leu Glu Gln Val Pro Tyr Asp Gly
165 170 175

Ile Leu Gly Leu Ala Tyr Pro Ser Leu Ala Ile Gln Gly Thr Thr Pro
180 185 190

Val Phe Asp Asn Leu Lys Asn Arg Glu Val Ile Ser Glu Pro Val Phe
195 200 205

Ala Phe Tyr Leu Ser Ser Arg Pro Glu Asn Ile Ser Thr Val Met Phe
210 215 220

Gly Gly Val Asp His Thr Tyr His Lys Gly Lys Leu Gln Trp Ile Pro
225 230 235 240

Val Thr Gln Ala Arg Phe Trp Gln Val Ala Met Ser Ser Met Thr Met
245 250 255

Asn Gly Asn Val Val Gly Cys Ser Gln Gly Cys Gln Ala Val Val Asp
260 265 270

Thr Gly Thr Ser Leu Leu Val Gly Pro Thr His Leu Val Thr Asp Ile
275 280 285

Leu Lys Leu Ile Asn Pro Asn Pro Ile Leu Asn Asp Glu Gln Met Leu
290 295 300

Ser Cys Asp Ala Ile Asn Ser Leu Pro Thr Leu Leu Leu Thr Ile Asn
305 310 315 320

Gly Ile Val Tyr Pro Val Pro Pro Asp Tyr Tyr Ile Gln Arg Phe Ser
325 330 335

Glu Arg Ile Cys Phe Ile Ser Phe Gln Gly Gly Thr Glu Ile Leu Lys
340 345 350

Asn Leu Gly Thr Ser Glu Thr Trp Ile Leu Gly Asp Val Phe Leu Arg
355 360 365

Leu Tyr Phe Ser Val Tyr Asp Arg Gly Asn Asn Arg Ile Gly Leu Ala
370 375 380

Pro Ala Ala
385

<210> 32
<211> 379
<212> PRT
<213> bovidae

<400> 32
Met Lys Trp Ile Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Gln Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Met Leu Lys Asn Phe Leu Lys Glu His Pro Tyr Arg Leu
35 40 45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Ile His Pro Leu Arg
50 55 60

Asn Ile Met Asn Leu Val Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

97

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Phe Cys Thr Met Pro Ala Cys Ser Ala Pro Val Trp Phe
100 105 110

Arg Gln Leu Gln Ser Ser Thr Phe Gln Pro Thr Asn Lys Thr Phe Thr
115 120 125

Ile Thr Tyr Gly Ser Gly Ser Met Lys Gly Phe Leu Ala Tyr Asp Thr
130 135 140

Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu Ser
145 150 155 160

Val Val Glu Tyr Gly Leu Glu Gly Arg Asn Tyr Asp Gly Val Leu Gly
165 170 175

Leu Asn Tyr Pro Asn Ile Ser Phe Ser Gly Ala Ile Pro Ile Phe Asp
180 185 190

Asn Leu Lys Asn Gln Gly Ala Ile Ser Glu Pro Val Phe Ala Phe Tyr
195 200 205

Leu Ser Lys Asn Lys Gln Glu Gly Ser Val Val Met Phe Gly Gly Val
210 215 220

Asp His Gln Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Leu Ile Glu
225 230 235 240

Ala Gly Glu Trp Arg Val His Met Asp Arg Ile Ser Met Lys Arg Thr
245 250 255

Val Ile Ala Cys Ser Asp Gly Cys Glu Ala Leu Val His Thr Gly Thr
260 265 270

Ser His Ile Glu Gly Pro Gly Arg Leu Val Asn Asn Ile His Arg Leu
275 280 285

Ile Arg Thr Arg Pro Phe Asp Ser Lys His Tyr Val Ser Cys Phe Ala
290 295 300

Thr Lys Tyr Leu Pro Ser Ile Thr Phe Ile Ile Asn Gly Ile Lys Tyr
305 310 315 320

Pro Met Thr Ala Arg Ala Tyr Ile Phe Lys Asp Ser Arg Gly Arg Cys
325 330 335

Tyr Ser Ala Phe Lys Glu Asn Thr Val Arg Thr Ser Arg Glu Thr Trp
340 345 350

Ile Leu Gly Asp Ala Phe Leu Arg Arg Tyr Phe Ser Val Phe Asp Arg
355 360 365

Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375

<210> 33
<211> 380
<212> PRT
<213> bovidae

<400> 33
Met Lys Trp Leu Gly Leu Leu Gly Leu Val Ala Leu Ser Glu Cys Met
1 5 10 15

Val Ile Ile Pro Leu Arg Gln Met Lys Thr Met Arg Glu Thr Leu Arg
20 25 30

Glu Arg His Leu Leu Thr Asn Phe Ser Glu Glu His Pro Tyr Asn Leu
35 40 45

Ser Gln Lys Ala Ala Asn Asp Gln Asn Ile Ile Tyr His His Pro Leu
50 55 60

Arg Ser Tyr Lys Asp Phe Ser Tyr Ile Gly Asn Ile Asn Ile Gly Thr
65 70 75 80

Pro Pro Gln Glu Phe Gln Val Leu Phe Asp Thr Gly Ser Ser Ser Leu
85 90 95

Trp Val Pro Ser Ile Tyr Cys Gln Ser Ser Ser Cys Tyr Lys His Asn
100 105 110

Ser Phe Val Pro Cys Asn Ser Ser Thr Phe Lys Ala Thr Asn Lys Ile
115 120 125

Phe Asn Thr Asn Tyr Thr Ala Thr Ser Ile Lys Gly Tyr Leu Val Tyr
130 135 140

Asp Thr Val Arg Ile Gly Asn Leu Val Ser Val Ala Gln Pro Phe Gly
145 150 155 160

Leu Ser Leu Lys Glu Phe Gly Phe Asp Asp Val Pro Phe Asp Gly Ile
165 170 175

Leu Gly Leu Gly Tyr Pro Arg Arg Thr Ile Thr Gly Ala Asn Pro Ile
180 185 190

Phe Asp Asn Leu Trp Lys Gln Gly Val Ile Ser Glu Pro Val Phe Ala
195 200 205

Phe Tyr Leu Ser Ser Gln Lys Glu Asn Gly Ser Val Val Met Phe Gly
210 215 220

Gly Val Asn Arg Ala Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Val
225 230 235 240

Ser Gln Val Gly Ser Trp His Ile Asn Ile Asp Ser Ile Ser Met Asn
245 250 255

Gly Thr Val Val Ala Cys Lys Arg Gly Cys Gln Ala Ser Trp Ile Arg
260 265 270

Gly Arg Leu Ser Ala Trp Pro Lys Arg Ile Val Ser Lys Ile Gln Lys
275 280 285

Leu Ile His Ala Arg Pro Ile Asp Arg Glu His Val Val Ser Cys Gln
290 295 300

Ala Ile Gly Thr Leu Pro Pro Ala Val Phe Thr Ile Asn Gly Ile Asp
305 310 315 320

Tyr Pro Val Pro Ala Gln Ala Tyr Ile Gln Ser Leu Ser Gly Tyr Cys
325 330 335

Phe Ser Asn Phe Leu Val Arg Pro Gln Arg Val Asn Glu Ser Glu Thr
340 345 350

Trp Ile Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Asn Arg Ile Gly Leu Ala Pro Ala Val
370 375 380

<210> 34
<211> 376
<212> PRT
<213> bovidae

<400> 34
Met Lys Trp Leu Val Phe Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Ile Met Leu Leu Thr Lys Thr Lys Thr Met Arg Glu Ile Trp Arg
20 25 30

Glu Lys Lys Leu Leu Asn Ser Phe Leu Glu Glu Gln Ala Asn Arg Met
35 40 45

Ser Asp Asp Ser Ala Ser Asp Pro Lys Leu Ser Thr His Pro Leu Arg
50 55 60

Asn Ala Leu Asp Met Ala Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Lys Glu Phe Arg Val Val Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Ile Lys Cys Ile Ser Pro Ala Cys His Thr His Ile Thr
100 105 110

100

```
Phe Asp His His Lys Ser Ser Thr Phe Arg Leu Thr Arg Arg Pro Phe
        115                 120                 125

His Ile Leu Tyr Gly Ser Gly Met Met Asn Gly Val Leu Ala Tyr Asp
    130                 135                 140

Thr Val Arg Ile Gly Lys Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145                 150                 155                 160

Ser Leu Gln Gln Phe Gly Phe Asp Asn Ala Pro Phe Asp Gly Val Leu
                165                 170                 175

Gly Leu Ser Tyr Pro Ser Leu Ala Val Pro Gly Thr Ile Pro Ile Phe
            180                 185                 190

Asp Lys Leu Lys Gln Gln Gly Ala Ile Ser Glu Pro Ile Phe Ala Phe
        195                 200                 205

Tyr Leu Ser Thr Arg Lys Glu Asn Gly Ser Val Leu Met Leu Gly Gly
    210                 215                 220

Val Asp His Ser Tyr His Lys Gly Lys Leu Asn Trp Ile Pro Val Ser
225                 230                 235                 240

Gln Thr Lys Ser Trp Leu Ile Thr Val Asp Arg Ile Ser Met Asn Gly
                245                 250                 255

Arg Val Ile Gly Cys Glu His Gly Cys Glu Ala Leu Val Asp Thr Gly
            260                 265                 270

Thr Ser Leu Ile His Gly Pro Ala Arg Pro Val Thr Asn Ile Gln Lys
        275                 280                 285

Phe Ile His Ala Met Pro Tyr Gly Ser Glu Tyr Met Val Leu Cys Pro
    290                 295                 300

Val Ile Ser Ile Leu Pro Pro Val Ile Phe Thr Ile Asn Gly Ile Asp
305                 310                 315                 320

Tyr Ser Val Pro Arg Glu Ala Tyr Ile Gln Lys Ile Ser Asn Ser Leu
                325                 330                 335

Cys Leu Ser Thr Phe His Gly Asp Asp Thr Asp Gln Trp Ile Leu Gly
            340                 345                 350

Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Tyr Asp Arg Gly Asn Asn
        355                 360                 365

Arg Ile Gly Leu Ala Pro Ala Val
    370                 375
```

<210> 35
<211> 375
<212> PRT
<213> bovidae

<400> 35

```
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Leu Ser Glu Cys Ile
  1               5                  10                  15

Val Ile Leu Pro Leu Arg Lys Met Lys Thr Leu Arg Glu Thr Leu Arg
             20                  25                  30

Glu Lys Asn Leu Leu Asn Asn Phe Leu Glu Glu Arg Ala Tyr Arg Leu
         35                  40                  45

Ser Lys Lys Asp Ser Lys Ile Thr Ile His Pro Leu Lys Asn Tyr Leu
     50                  55                  60

Asp Met Ala Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro Pro Gln Glu
 65                  70                  75                  80

Phe Arg Val Val Phe Asp Thr Gly Ser Ala Asp Leu Trp Val Pro Ser
                 85                  90                  95

Ile Ser Cys Val Ser Pro Ala Cys Tyr Thr His Lys Thr Phe Asn Leu
            100                 105                 110

His Asn Ser Ser Ser Phe Gly Gln Thr His Gln Pro Ile Ser Ile Ser
        115                 120                 125

Tyr Gly Pro Gly Ile Ile Gln Gly Phe Leu Gly Ser Asp Thr Val Arg
    130                 135                 140

Ile Gly Asn Leu Val Ser Leu Lys Gln Ser Phe Gly Leu Ser Gln Glu
145                 150                 155                 160

Glu Tyr Gly Phe Asp Gly Ala Pro Phe Asp Gly Val Leu Gly Leu Ala
                165                 170                 175

Tyr Pro Ser Ile Ser Ile Lys Gly Ile Ile Pro Ile Phe Asp Asn Leu
            180                 185                 190

Trp Ser Gln Gly Ala Phe Ser Glu Pro Val Phe Ala Phe Tyr Leu Asn
        195                 200                 205

Thr Cys Gln Pro Glu Gly Ser Val Val Met Phe Gly Gly Val Asp His
    210                 215                 220

Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Val Ser Gln Thr Arg
225                 230                 235                 240

Tyr Trp Gln Ile Ser Met Asn Arg Ile Ser Met Asn Gly Asn Val Thr
                245                 250                 255
```

```
Ala Cys Ser Arg Gly Cys Gln Ala Leu Leu Asp Thr Gly Thr Ser Met
            260                 265                 270

Ile His Gly Pro Thr Arg Leu Ile Thr Asn Ile His Lys Leu Met Asn
        275                 280                 285

Ala Arg His Gln Gly Ser Glu Tyr Val Val Ser Cys Asp Ala Val Lys
    290                 295                 300

Thr Leu Pro Pro Val Ile Phe Asn Ile Asn Gly Ile Asp Tyr Pro Leu
305                 310                 315                 320

Pro Pro Gln Ala Tyr Ile Thr Lys Ala Gln Asn Phe Cys Leu Ser Ile
                325                 330                 335

Phe His Gly Gly Thr Glu Thr Ser Ser Pro Glu Thr Trp Ile Leu Gly
            340                 345                 350

Gly Val Phe Leu Arg Gln Tyr Phe Ser Val Phe Asp Arg Arg Asn Asp
        355                 360                 365

Ser Ile Gly Leu Ala Gln Val
    370                 375

<210> 36
<211> 391
<212> PRT
<213> bovidae

<400> 36
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Leu Ser Glu Cys Ile
  1               5                  10                  15

Val Ile Leu Pro Leu Lys Lys Met Lys Thr Leu Arg Glu Thr Leu Arg
             20                  25                  30

Glu Lys Asn Leu Leu Asn Asn Phe Leu Glu Glu Gln Ala Tyr Arg Leu
         35                  40                  45

Ser Lys Asn Asp Ser Lys Ile Thr Ile His Pro Leu Arg Asn Tyr Leu
     50                  55                  60

Asp Thr Ala Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro Pro Gln Glu
 65                  70                  75                  80

Phe Arg Val Val Phe Asp Thr Gly Ser Ala Asn Leu Trp Val Pro Cys
                 85                  90                  95

Ile Thr Cys Thr Ser Pro Ala Cys Tyr Thr His Lys Thr Phe Asn Pro
            100                 105                 110

Gln Asn Ser Ser Ser Phe Arg Glu Val Gly Ser Pro Ile Thr Ile Phe
        115                 120                 125
```

```
Tyr Gly Ser Gly Ile Ile Gln Gly Phe Leu Gly Ser Asp Thr Val Arg
    130                 135                 140

Ile Gly Asn Leu Val Ser Leu Lys Gln Ser Phe Gly Leu Ser Gln Glu
145                 150                 155                 160

Glu Tyr Gly Phe Asp Gly Ala Pro Phe Asp Gly Val Leu Gly Leu Ala
                165                 170                 175

Tyr Pro Ser Ile Ser Ile Lys Gly Ile Ile Pro Ile Phe Asp Asn Leu
            180                 185                 190

Trp Ser His Gly Ala Phe Ser Glu Pro Val Phe Ala Phe Tyr Leu Asn
        195                 200                 205

Thr Asn Lys Pro Glu Gly Ser Val Val Met Phe Gly Gly Val Asp His
    210                 215                 220

Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Val Ser Gln Thr Ser
225                 230                 235                 240

His Trp Gln Ile Ser Met Asn Asn Ile Ser Met Asn Gly Thr Val Thr
                245                 250                 255

Ala Cys Ser Cys Gly Cys Glu Ala Leu Leu Asp Thr Gly Thr Ser Met
            260                 265                 270

Ile Tyr Gly Pro Thr Lys Leu Val Thr Asn Ile His Lys Leu Met Asn
        275                 280                 285

Ala Arg Leu Glu Asn Ser Glu Tyr Val Val Ser Cys Asp Ala Val Lys
    290                 295                 300

Thr Leu Pro Pro Val Ile Phe Asn Ile Asn Gly Ile Asp Tyr Pro Leu
305                 310                 315                 320

Arg Pro Gln Ala Tyr Ile Ile Lys Ile Gln Asn Asn Cys Arg Ser Val
                325                 330                 335

Phe Gln Gly Gly Thr Glu Asn Ser Ser Leu Asn Thr Trp Ile Leu Gly
            340                 345                 350

Asp Ile Phe Leu Arg Gln Tyr Phe Ser Val Phe Asp Arg Lys Asn Arg
        355                 360                 365

Arg Ile Cys Trp His Arg Trp Val Pro Thr Thr Arg Thr Thr Met Thr
    370                 375                 380

Ser Lys Leu Pro Pro Lys Leu
385                 390
```

<210> 37
<211> 392
<212> PRT
<213> bovidae

<400> 37
Met Lys Trp Leu Val Leu Leu Ala Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Ile Lys Ile Pro Leu Arg Arg Val Lys Thr Met Ser Asn Thr Ala Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Lys His Pro Tyr Arg Leu
35 40 45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Thr His Pro Leu Met
50 55 60

Asn Ile Trp Asp Leu Leu Tyr Leu Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Leu Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Leu Leu Cys Asn Ser Ser Thr Cys Ala Lys His Val Met
100 105 110

Phe Arg His Arg Leu Ser Ser Thr Tyr Arg Pro Thr Asn Lys Thr Phe
115 120 125

Met Ile Phe Tyr Ala Val Gly Lys Ile Glu Gly Val Val Val Arg Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Ala Asp Gln Thr Phe Gly Leu
145 150 155 160

Ser Ile Ala Glu Thr Gly Phe Glu Asn Thr Thr Leu Asp Gly Ile Leu
165 170 175

Gly Leu Ser Tyr Pro Asn Thr Ser Cys Phe Gly Thr Ile Pro Ile Phe
180 185 190

Asp Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Leu His Ser
195 200 205

Val Arg Arg Lys Asp Glu Gln Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Ser Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile
225 230 235 240

Lys Ala Gly Asp Trp Ser Val Arg Val Asp Ser Ile Thr Met Lys Arg
245 250 255

```
Glu Val Ile Ala Cys Ser Asp Gly Cys Arg Ala Leu Val Asp Thr Gly
            260                 265                 270

Ser Ser His Ile Gln Gly Pro Gly Arg Leu Ile Asp Asn Val Gln Lys
        275                 280                 285

Leu Ile Gly Thr Met Pro Gln Gly Ser Met His Tyr Val Pro Cys Ser
    290                 295                 300

Ala Val Asn Thr Leu Pro Ser Ile Ile Phe Thr Ile Asn Ser Ile Ser
305                 310                 315                 320

Tyr Thr Val Pro Ala Gln Ala Tyr Ile Leu Lys Gly Ser Arg Gly Arg
                325                 330                 335

Cys Tyr Ser Thr Phe Gln Gly His Thr Met Ser Ser Ser Thr Glu Thr
            340                 345                 350

Trp Ile Leu Gly Asp Val Phe Leu Ser Gln Tyr Phe Ser Val Phe Asp
        355                 360                 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Gln Val Gly Thr Asp Tyr Lys
    370                 375                 380

Asp Asp Asp Glu Ser Pro Lys Leu
385                 390
```

<210> 38
<211> 388
<212> PRT
<213> Felis domestica

<400> 38

```
Met Lys Trp Leu Trp Val Leu Gly Leu Val Ala Leu Ser Glu Cys Leu
  1               5                  10                  15

Val Thr Ile Pro Leu Thr Arg Val Lys Ser Met Arg Glu Asn Leu Arg
             20                  25                  30

Glu Lys Asp Arg Leu Lys Asp Phe Leu Glu Asn His Pro Tyr Asn Leu
         35                  40                  45

Ala Tyr Lys Phe Val Asp Ser Val Asn Leu Asp Leu Gly Ile Tyr Phe
     50                  55                  60

Glu Pro Met Arg Asn Tyr Leu Asp Leu Ala Tyr Val Gly Thr Ile Ser
 65                  70                  75                  80

Ile Gly Thr Pro Pro Gln Glu Phe Lys Val Ile Phe Asp Thr Gly Ser
                 85                  90                  95

Ser Asp Leu Trp Val Pro Ser Ile Tyr Cys Ser Ser Pro Ala Cys Ala
            100                 105                 110
```

Asn His Asn Val Phe Asn Pro Leu Arg Ser Ser Thr Phe Arg Ile Ser
115 120 125

Gly Arg Pro Ile His Leu Gln Tyr Gly Ser Gly Thr Met Ser Gly Phe
130 135 140

Leu Ala Tyr Asp Thr Val Arg Phe Gly Gly Leu Val Asp Val Ala Gln
145 150 155 160

Ala Phe Gly Leu Ser Leu Arg Glu Pro Gly Lys Phe Met Glu Tyr Ala
165 170 175

Val Phe Asp Gly Ile Leu Gly Leu Ala Tyr Pro Ser Leu Ser Leu Arg
180 185 190

Gly Thr Val Pro Val Phe Asp Asn Leu Trp Lys Gln Gly Leu Ile Ser
195 200 205

Gln Glu Leu Phe Ala Phe Tyr Leu Ser Lys Lys Asp Glu Glu Gly Ser
210 215 220

Val Val Met Phe Gly Gly Val Asp His Ser Tyr Tyr Ser Gly Asp Leu
225 230 235 240

Asn Trp Val Pro Val Ser Lys Arg Leu Tyr Trp Gln Leu Ser Met Asp
245 250 255

Ser Ile Ser Met Asn Gly Glu Val Ile Ala Cys Asp Gly Gly Cys Gln
260 265 270

Ala Ile Ile Asp Thr Gly Thr Ser Leu Leu Ile Gly Pro Ser His Val
275 280 285

Val Phe Asn Ile Gln Met Ile Ile Gly Ala Asn Gln Ser Tyr Ser Gly
290 295 300

Glu Tyr Val Val Asp Cys Asp Ala Ala Asn Thr Leu Pro Asp Ile Val
305 310 315 320

Phe Thr Ile Asn Gly Ile Asp Tyr Pro Val Pro Ala Ser Ala Tyr Ile
325 330 335

Gln Glu Gly Pro Gln Gly Thr Cys Tyr Ser Gly Phe Asp Glu Ser Gly
340 345 350

Asp Ser Leu Leu Val Ser Asp Ser Trp Ile Leu Gly Asp Val Phe Leu
355 360 365

Arg Leu Tyr Phe Thr Val Phe Asp Arg Glu Asn Asn Arg Ile Gly Leu
370 375 380

Ala Leu Ala Val
385

<210> 39
<211> 1158
<212> DNA
<213> bovidae

<400> 39
aggaaagaag catgaagtgg cttgtggtcc tcgggctggt ggccttctca gagtgcatag 60
tcaaaatacc tctaaggaga gtgaagacca tgagaaaaac tctcagtgga aaaaacatgc 120
tgaacaattt cttgaaggag gatccttaca gactgtccca gatttctttt cgtggctcaa 180
atctaactat tcacccgctg agaaacatca gagatatctt ctatgtcgga aacatcacca 240
ttggaacacc ccctcaggaa ttccaggtta tctttgacac aggctcatct gacttgtggg 300
tgccctcgat cgattgcaac agtacatcct gtgctacaca tgttaggttc agacatcttc 360
agtcttccac cttccggcct accaataaga ccttcaggat catctatgga tctgggagaa 420
tgaacggagt tattgcttat gacacagttc ggattgggga ccttgtaagt accgaccagc 480
catttggtct aagcgtggag gaatatgggt ttgcgcacaa aagatttgat ggcatcttgg 540
gcttgaacta ctggaaccta tcctggtcta aggccatgcc catctttgac aagctgaaga 600
atgaaggcgc catttctgag cctgtttttg ccttctactt gagcaaagac aagcgggagg 660
gcagtgtggt gatgtttggt ggggtggacc accgctacta caagggagag ctcaagtggg 720
taccactgat ccaagcagtc gactggagtg tacacgtaga ccgcatcacc atgaacagag 780
aggttattgc ttgttctgaa ggctgtgcgg cccttgtgga cactgggtca tcaaatatcc 840
aaggcccaag aagactgatt gataacatac agaggatcat cggcgccacg ccacggggtt 900
ccaagtacta cgtttcatgt tctgcggtca atatcctgcc ctctattatc ttcaccatca 960
acggcgtcaa ctacccagtg ccacctcgag cttacatcct caaggattct agaggccact 1020
gctataccac ctttaaagag aaaagagtga ggagatctac agagagctgg gtcctgggtg 1080
aagtcttcct gaggctgtat ttctcagtct ttgatcgagg aaatgacagg attggcctgg 1140
cacgggcagt gtaactcg 1158

<210> 40
<211> 380
<212> PRT
<213> bovidae

<400> 40
Met Lys Trp Leu Val Val Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu Asp Pro Tyr Arg Leu
35 40 45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Ile His Pro Leu Arg
50 55 60

Asn Ile Arg Asp Ile Phe Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Ile Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Ile Asp Cys Asn Ser Thr Ser Cys Ala Thr His Val Arg
100 105 110

Phe Arg His Leu Gln Ser Ser Thr Phe Arg Pro Thr Asn Lys Thr Phe
115 120 125

Arg Ile Ile Tyr Gly Ser Gly Arg Met Asn Gly Val Ile Ala Tyr Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145 150 155 160

Ser Val Glu Glu Tyr Gly Phe Ala His Lys Arg Phe Asp Gly Ile Leu
165 170 175

Gly Leu Asn Tyr Trp Asn Leu Ser Trp Ser Lys Ala Met Pro Ile Phe
180 185 190

Asp Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Asp Lys Arg Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Lys Trp Val Pro Leu Ile
225 230 235 240

Gln Ala Val Asp Trp Ser Val His Val Asp Arg Ile Thr Met Asn Arg
245 250 255

Glu Val Ile Ala Cys Ser Glu Gly Cys Ala Ala Leu Val Asp Thr Gly
260 265 270

Ser Ser Asn Ile Gln Gly Pro Arg Arg Leu Ile Asp Asn Ile Gln Arg
275 280 285

Ile Ile Gly Ala Thr Pro Arg Gly Ser Lys Tyr Tyr Val Ser Cys Ser
290 295 300

Ala Val Asn Ile Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Val Asn
305 310 315 320

Tyr Pro Val Pro Pro Arg Ala Tyr Ile Leu Lys Asp Ser Arg Gly His
325 330 335

Cys Tyr Thr Thr Phe Lys Glu Lys Arg Val Arg Arg Ser Thr Glu Ser
340 345 350

Trp Val Leu Gly Glu Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 41
<211> 1155
<212> DNA
<213> bovidae

<400> 41
aggaaagaag catgaagtgg attgtgctcc tcgggctgat ggccttctca gagtgcatag 60
tccaaatacc tctaaggcaa gtgaagacca tgagaaaaac cctcagtgga aaaaacatgc 120
tgaagaattt cttgaaggag catccttaca gactgtccca gatttctttt cgtggctcaa 180
atctaactat tcacccgctg aggaacatca tgaatttggt ctacgtgggt aacatcacca 240
ttggaacacc ccctcaggaa ttccaggttg tctttgacac aggctcatct gacttgtggg 300
tgccctcctt ttgtaccatg ccagcatgct ctgcaccggt ttggttcaga caacttcagt 360
cttccacctt ccagcctacc aataagacct tcaccatcac ctatggatct gggagcatga 420
agggatttct tgcttatgac acagttcgga ttggggacct tgtaagtact gatcagccgt 480
tcggtctaag cgtggtggaa tatgggttgg agggcagaaa ttatgatggt gccttgggct 540
tgaactaccc caacatatcc ttctctggag ccatccccat ctttgacaac ctgaagaatc 600
aaggtgccat ttctgagcct gtttttgcct tctacttgag caaaaacaag caggagggca 660
gtgtggtgat gtttggtggg gtggaccacc agtactacaa gggagagctc aactggatac 720
cactgattga agcaggcgaa tggagagtac acatggaccg catctccatg aaaagaacgg 780
ttattgcttg ttctgatggc tgtgaggccc ttgtgcacac tgggacatca catatcgaag 840
gcccaggaag actggtgaat aacatacaca ggctcatccg caccaggcca tttgattcca 900
agcactacgt ttcatgtttt gccaccaata ccctgccctc tattactttc atcatcaacg 960
gcatcaagta cccaatgaca gctcgagcct acatctttaa ggattctaga ggccgctgct 1020
attccgcttt taaagagaac acagtgagaa catctagaga gacctggatc ctcggtgatg 1080
ccttcctgag gcggtatttc tcagtctttg atcgaggaaa tgacaggatt ggcctggcac 1140
gggcagtgta actcg 1155

<210> 42
<211> 379
<212> PRT
<213> bovidae

<400> 42
Met Lys Trp Ile Val Leu Leu Gly Leu Met Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Gln Ile Pro Leu Arg Gln Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Met Leu Lys Asn Phe Leu Lys Glu His Pro Tyr Arg Leu
35 40 45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Ile His Pro Leu Arg
50 55 60

Asn Ile Met Asn Leu Val Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Phe Cys Thr Met Pro Ala Cys Ser Ala Pro Val Trp Phe
100 105 110

```
Arg Gln Leu Gln Ser Ser Thr Phe Gln Pro Thr Asn Lys Thr Phe Thr
        115                 120                 125

Ile Thr Tyr Gly Ser Gly Ser Met Lys Gly Phe Leu Ala Tyr Asp Thr
    130                 135                 140

Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu Ser
145                 150                 155                 160

Val Val Glu Tyr Gly Leu Glu Gly Arg Asn Tyr Asp Gly Ala Leu Gly
                165                 170                 175

Leu Asn Tyr Pro Asn Ile Ser Phe Ser Gly Ala Ile Pro Ile Phe Asp
            180                 185                 190

Asn Leu Lys Asn Gln Gly Ala Ile Ser Glu Pro Val Phe Ala Phe Tyr
        195                 200                 205

Leu Ser Lys Asn Lys Gln Glu Gly Ser Val Val Met Phe Gly Gly Val
    210                 215                 220

Asp His Gln Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Leu Ile Glu
225                 230                 235                 240

Ala Gly Glu Trp Arg Val His Met Asp Arg Ile Ser Met Lys Arg Thr
                245                 250                 255

Val Ile Ala Cys Ser Asp Gly Cys Glu Ala Leu Val His Thr Gly Thr
            260                 265                 270

Ser His Ile Glu Gly Pro Gly Arg Leu Val Asn Asn Ile His Arg Leu
        275                 280                 285

Ile Arg Thr Arg Pro Phe Asp Ser Lys His Tyr Val Ser Cys Phe Ala
    290                 295                 300

Thr Asn Thr Leu Pro Ser Ile Thr Phe Ile Ile Asn Gly Ile Lys Tyr
305                 310                 315                 320

Pro Met Thr Ala Arg Ala Tyr Ile Phe Lys Asp Ser Arg Gly Arg Cys
                325                 330                 335

Tyr Ser Ala Phe Lys Glu Asn Thr Val Arg Thr Ser Arg Glu Thr Trp
            340                 345                 350

Ile Leu Gly Asp Ala Phe Leu Arg Arg Tyr Phe Ser Val Phe Asp Arg
        355                 360                 365

Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
    370                 375
```

<210> 43
<211> 1154
<212> DNA
<213> bovidae

<400> 43
aggaaagaag catgaagtgg cttgtgctcc tagggctggt ggccttctca gagtgcgtag 60
tcaaaatacc tctaaggaga gtgaagacca tgacaaaaac cctcagtggg aaaaacatgc 120
tgaacaattt cctgaaggag catgcttaca gactgtccca gatttctttt catggctcaa 180
atctaactat tcacccgctg agaaacatca gggatttgtt ctacatgggt aacatcacca 240
ttggaacacc ccctcaggaa ttcctggttg tctttgacac aggctcatct gacttgtggg 300
ttccctccga cttttgcacc agtccagcct gttctaaaca ctttaggttc agacatcttc 360
agtcttccac attccggctt accaataaga ccttcagcat tgaatacgga tctgggacaa 420
tggaaggaat tgttgctcat gacacagttc ggattgggga ccttgtaagc actgaccagc 480
cgtttggtct aagcatgaca gaatccgggt ttgagggtat acctttgat ggcgtcttgg 540
gcttgaacta ccccaacata tccttctctg gagccatccc catctttgac aagctgaaga 600
atcaaggtgc catttctgag cctgtttttg ccttctattt gagcaaagac gagcaggagg 660
gcagtgtggt gatgtttggt ggggtggacc accgctacta caagggagag ctcaaatggg 720
taccattgat tgaagcgggt gactggattg tacacatgga ctgcatctcc atgagaagaa 780
aggttattgc ttgttctggc ggctgtgagg ccgttgttga caccggggta tcaatgatca 840
aaggcccaaa aacactggtt gataacatcc agaagctcat cggtgccact ctacggggtt 900
tcaagcacta cgtttcatgt tctgcagtcg ataccctgcc ctctattacc ttcaccataa 960
acggtatcaa ctaccgagtg ccagctcgag cctacatcct caaggattct agaggctgct 1020
gctatagcag ctttcaagag accactgtga gtccatctac agagacctgg atcctgggtg 1080
acgtcttcct gagactgtat ttctcagtct ttgatcgagg aaatgacagg attgggctgg 1140
cacgggcagt gtaa 1154

<210> 44
<211> 380
<212> PRT
<213> bovidae

<400> 44
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Val
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Thr Lys Thr Leu Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu His Ala Tyr Arg Leu
35 40 45

Ser Gln Ile Ser Phe His Gly Ser Asn Leu Thr Ile His Pro Leu Arg
50 55 60

Asn Ile Arg Asp Leu Phe Tyr Met Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Leu Val Val Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Asp Phe Cys Thr Ser Pro Ala Cys Ser Lys His Phe Arg
100 105 110

Phe Arg His Leu Gln Ser Ser Thr Phe Arg Leu Thr Asn Lys Thr Phe
115 120 125

Ser Ile Glu Tyr Gly Ser Gly Thr Met Glu Gly Ile Val Ala His Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145 150 155 160

Ser Met Thr Glu Ser Gly Phe Glu Gly Ile Pro Phe Asp Gly Val Leu
165 170 175

Gly Leu Asn Tyr Pro Asn Ile Ser Phe Ser Gly Ala Ile Pro Ile Phe
180 185 190

Asp Lys Leu Lys Asn Gln Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Asp Glu Gln Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Lys Trp Val Pro Leu Ile
225 230 235 240

Glu Ala Gly Asp Trp Ile Val His Met Asp Cys Ile Ser Met Arg Arg
245 250 255

Lys Val Ile Ala Cys Ser Gly Gly Cys Glu Ala Val Val Asp Thr Gly
260 265 270

Val Ser Met Ile Lys Gly Pro Lys Thr Leu Val Asp Asn Ile Gln Lys
275 280 285

Leu Ile Gly Ala Thr Leu Arg Gly Phe Lys His Tyr Val Ser Cys Ser
290 295 300

Ala Val Asp Thr Leu Pro Ser Ile Thr Phe Thr Ile Asn Gly Ile Asn
305 310 315 320

Tyr Arg Val Pro Ala Arg Ala Tyr Ile Leu Lys Asp Ser Arg Gly Cys
325 330 335

Cys Tyr Ser Ser Phe Gln Glu Thr Thr Val Ser Pro Ser Thr Glu Thr
340 345 350

Trp Ile Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 45
<211> 1168
<212> DNA
<213> bovidae

<400> 45
aggaaagaag catgaagtgg cttgtgctcc tcgggctggt ggccttctca gagtgcatag 60
tcaaaatacc tctaaggaga gtgaagacca tgagaaaaac cctcagtgga aaaaacacgc 120
tgaacaattt cttgaaggag catccttaca gactgtccca tatttctttt cgtggctcaa 180
atctaactac tctgccgctg agaaacatca gagatatgct ctacgtgggt aacatcacca 240
ttggaacacc ccctcaagaa ttccaggttg tctttgacac aggttcatct gacttgtggg 300
tgccctctga cttttgcacc agtccagcct gttctacaca cgttaggttc agacattttc 360
agtcttccac cttccggcct accactaaga ccttcaggat catctatgga tctgggagaa 420
tgaaaggagt tgttgcgcat gacacagttc ggattgggaa ccttgtaagt actgaccagc 480
cgttcggcct aagcatggcg gaatacgggt tggagagcag aagatttgat ggcatcttgg 540
gcttgaacta ccccaatcta tcctgctctg gggccattcc catctttgat aagctgaaga 600
atcaaggtgc catttctgat cctatttttg ccttctactt gagcaaagac aagcgagagg 660
gcagtgtggt gatgtttggt ggggtggacc accgctacta caagggagag ctcaactggg 720
taccactgat tcgagcaggt gactggattg tacacgtaga ccgcatcacc atgaaaagag 780
aggttattgc ttgttctgat ggctgcgcgg cccttgtgga cactgggaca tcacttatcc 840
aaggcccagg aagagtgatc gataacatac acaagctcat tggtgccacg ccacggggtt 900
ccaagcatta cgtttcatgt tctgtggtca atactctgcc ctctattatc ttcaccatca 960
atggcatcaa ctacccagtg ccagctccag cctacatcct caaggattct agaggctact 1020
gctataccgc ctttaaagag caaagagtga ggagatctac agagagctgg ttactgggtg 1080
acgtcttcct gaggctgtat ttctcagtct ttgatcgagg aaatgacagg attggcctgg 1140
cacgggcagt gtaactcgaa tcactagt 1168

<210> 46
<211> 380
<212> PRT
<213> bovidae

<400> 46
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Thr Leu Asn Asn Phe Leu Lys Glu His Pro Tyr Arg Leu
35 40 45

Ser His Ile Ser Phe Arg Gly Ser Asn Leu Thr Thr Leu Pro Leu Arg
50 55 60

Asn Ile Arg Asp Met Leu Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Asp Phe Cys Thr Ser Pro Ala Cys Ser Thr His Val Arg
100 105 110

```
Phe Arg His Phe Gln Ser Ser Thr Phe Arg Pro Thr Thr Lys Thr Phe
        115                 120                 125

Arg Ile Ile Tyr Gly Ser Gly Arg Met Lys Gly Val Val Ala His Asp
    130                 135                 140

Thr Val Arg Ile Gly Asn Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145                 150                 155                 160

Ser Met Ala Glu Tyr Gly Leu Glu Ser Arg Arg Phe Asp Gly Ile Leu
                165                 170                 175

Gly Leu Asn Tyr Pro Asn Leu Ser Cys Ser Gly Ala Ile Pro Ile Phe
            180                 185                 190

Asp Lys Leu Lys Asn Gln Gly Ala Ile Ser Asp Pro Ile Phe Ala Phe
        195                 200                 205

Tyr Leu Ser Lys Asp Lys Arg Glu Gly Ser Val Val Met Phe Gly Gly
    210                 215                 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile
225                 230                 235                 240

Arg Ala Gly Asp Trp Ile Val His Val Asp Arg Ile Thr Met Lys Arg
                245                 250                 255

Glu Val Ile Ala Cys Ser Asp Gly Cys Ala Ala Leu Val Asp Thr Gly
            260                 265                 270

Thr Ser Leu Ile Gln Gly Pro Gly Arg Val Ile Asp Asn Ile His Lys
        275                 280                 285

Leu Ile Gly Ala Thr Pro Arg Gly Ser Lys His Tyr Val Ser Cys Ser
    290                 295                 300

Val Val Asn Thr Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Ile Asn
305                 310                 315                 320

Tyr Pro Val Pro Ala Pro Ala Tyr Ile Leu Lys Asp Ser Arg Gly Tyr
                325                 330                 335

Cys Tyr Thr Ala Phe Lys Glu Gln Arg Val Arg Arg Ser Thr Glu Ser
            340                 345                 350

Trp Leu Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
        355                 360                 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
    370                 375                 380
```

<210> 47
<211> 1158
<212> DNA
<213> bovidae

<400> 47
aggaaagaag catgaagtgg cttgtgctcc tctggctagt ggccttctca gagtgtatag 60
tcaaaatacc tctaaggcaa gtgaagacca tgagaaaaac cctcagtgga aaaaacacgc 120
tgaacaattt cttgaaggaa catacttaca gtctgtccca gatttcttct cgtggttcaa 180
atctaactat tcacccactg agaaacatca tggatatgct ctacgtgggt aacatcacca 240
ttggaacacc ccctcaggaa ttccaggttg tctttgacac aggctcatct gacttgtggg 300
tgccctccgt cttttgccaa agtctagcct gtgctacaaa ggttatgttc atacatcttc 360
attcttccac cttccggcat acccaaaagg tcttcaacat caagtacaat actggaagga 420
tgaaaggact tcttgtttat gacactgttc ggattgggga ccttgtaagt actgaccagc 480
cattctgtat aagcctggca gaagttgggt ttgacggtat acctttgat ggtgtcttgg 540
gcttgaacta tccgaacatg tccttctctg gagccatccc catctttgac aacctgaaga 600
atgaaggtgc catttctgag cctgtttttg ccttctactt gagcaaagac aagcgggagg 660
gcagtgtggt gatgtttggt ggggtggacc accgctacta caagggagag ctcaactggg 720
tgccattgat ccaagcgggc ggctggactg tacacgtgga ccgcatctcc atgaaaagaa 780
agattattgc ttgttctgga ggctgcgagg cccttgtgga caccggaaca gcactgatca 840
aaggcccaag aagactggtc aataacatac agaagctcat cggcaccacg ccacggggtt 900
ccaagcacta cgtttcatgt tctgtggtca ataccctgcc ctctattatc ttcaccatca 960
acggcatcaa ctacccggtg ccagcacgag cctacatcct caaggattct gaaagcaact 1020
gctatacaac ctttaaagag aacacagtga ggacgtctag agagacctgg atcctgggtg 1080
acgtcttccc gaggctgtat ttctcagtct ttgatcgagg aaatgacagg attggcctgg 1140
cacgggcagt gtaactcg 1158

<210> 48
<211> 380
<212> PRT
<213> bovidae

<400> 48
Met Lys Trp Leu Val Leu Leu Trp Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Gln Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Thr Leu Asn Asn Phe Leu Lys Glu His Thr Tyr Ser Leu
35 40 45

Ser Gln Ile Ser Ser Arg Gly Ser Asn Leu Thr Ile His Pro Leu Arg
50 55 60

Asn Ile Met Asp Met Leu Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Val Phe Cys Gln Ser Leu Ala Cys Ala Thr Lys Val Met
100 105 110

```
Phe Ile His Leu His Ser Ser Thr Phe Arg His Thr Gln Lys Val Phe
        115                 120                 125

Asn Ile Lys Tyr Asn Thr Gly Arg Met Lys Gly Leu Leu Val Tyr Asp
    130                 135                 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Cys Ile
145                 150                 155                 160

Ser Leu Ala Glu Val Gly Phe Asp Gly Ile Pro Phe Asp Gly Val Leu
                165                 170                 175

Gly Leu Asn Tyr Pro Asn Met Ser Phe Ser Gly Ala Ile Pro Ile Phe
            180                 185                 190

Asp Asn Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
        195                 200                 205

Tyr Leu Ser Lys Asp Lys Arg Glu Gly Ser Val Val Met Phe Gly Gly
    210                 215                 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile
225                 230                 235                 240

Gln Ala Gly Gly Trp Thr Val His Val Asp Arg Ile Ser Met Lys Arg
                245                 250                 255

Lys Ile Ile Ala Cys Ser Gly Gly Cys Glu Ala Leu Val Asp Thr Gly
            260                 265                 270

Thr Ala Leu Ile Lys Gly Pro Arg Arg Leu Val Asn Asn Ile Gln Lys
        275                 280                 285

Leu Ile Gly Thr Thr Pro Arg Gly Ser Lys His Tyr Val Ser Cys Ser
    290                 295                 300

Val Val Asn Thr Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Ile Asn
305                 310                 315                 320

Tyr Pro Val Pro Ala Arg Ala Tyr Ile Leu Lys Asp Ser Glu Ser Asn
                325                 330                 335

Cys Tyr Thr Thr Phe Lys Glu Asn Thr Val Arg Thr Ser Arg Glu Thr
            340                 345                 350

Trp Ile Leu Gly Asp Val Phe Pro Arg Leu Tyr Phe Ser Val Phe Asp
        355                 360                 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
    370                 375                 380
```

<210> 49
<211> 1158
<212> DNA
<213> bovidae

<400> 49
taggaaagaa gcatgaagtg gcttgtgctc ctcgggctgg tggccttctc agagtgcata 60
gtcaaaatac ctctaaggag agtgaagacc atgagaaaaa ccctcagtgg aaaaaacatc 120
ctgaacaatt tcctgaagga acatgcttac agactgtccc agatttcttc ttgtggctca 180
aatctaactt ttcacccctt gagaaacatc aaggataggc tctacgtggg taacatcacc 240
attggaacac cccctcaaga attccaggtt atctttgaca caggctcatc tgacttgtgg 300
gtgacctccg tcttttgcac cagcccaacc tgttctacac atgttatgtt cagacatttt 360
gattcttcca ccttccggcc taccaaaaag accttcagca tcaactacgg ttctggaagg 420
atgaaaggag ttgttgttca tgacacagtt cggattgggg accttgtaag tactgaccag 480
ccatttggtc taagtgtggt ggaacttggg tttgatggta tacctttga tggcgtcatg 540
ggcttgaact accccaaact atccttctct ggagccattc ccatctttga caacctgagg 600
aatcaaggtg ccatttctga gcctgttttt gccttctact tgagcaaaga cgagcaggag 660
ggcagtgtgg tgatgtttgg tggggtggac caccgctact acaagggaga gctcaactgg 720
ataccactga tccaagcagg cgactggagt gtacacatgg acagcatctc catgaaaaga 780
aaggttattg cttgctctgg tggctgcaag gccgttgtgg acaccgggac atcactgatt 840
gaaggcccaa gaagactggt caataacata cagaagctca tcagagccat gccacggggt 900
tccgagtact acgtttcatg ttctgcggtc aataccctgc cccctattat cttcaccatc 960
aaaggcatca actacccagt gccagctcaa gcctacatcc tcaaggattc tagaggccac 1020
tgctatacca cctttaaaga ggacagattg agtccaccat ctacagagac ctggatcctg 1080
ggtgacgtct tcctgaggcg gtatttctcg gtctttgatc gaggaaatga caggattggc 1140
ctggcacggg cagtgtaa 1158

<210> 50
<211> 381
<212> PRT
<213> bovidae

<400> 50
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Ile Leu Asn Asn Phe Leu Lys Glu His Ala Tyr Arg Leu
35 40 45

Ser Gln Ile Ser Ser Cys Gly Ser Asn Leu Thr Phe His Pro Leu Arg
50 55 60

Asn Ile Lys Asp Arg Leu Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Ile Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Thr Ser Val Phe Cys Thr Ser Pro Thr Cys Ser Thr His Val Met
100 105 110

Phe Arg His Phe Asp Ser Ser Thr Phe Arg Pro Thr Lys Lys Thr Phe
115 120 125

Ser Ile Asn Tyr Gly Ser Gly Arg Met Lys Gly Val Val Val His Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145 150 155 160

Ser Val Val Glu Leu Gly Phe Asp Gly Ile Pro Phe Asp Gly Val Met
165 170 175

Gly Leu Asn Tyr Pro Lys Leu Ser Phe Ser Gly Ala Ile Pro Ile Phe
180 185 190

Asp Asn Leu Arg Asn Gln Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Asp Glu Gln Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Leu Ile
225 230 235 240

Gln Ala Gly Asp Trp Ser Val His Met Asp Ser Ile Ser Met Lys Arg
245 250 255

Lys Val Ile Ala Cys Ser Gly Gly Cys Lys Ala Val Val Asp Thr Gly
260 265 270

Thr Ser Leu Ile Glu Gly Pro Arg Arg Leu Val Asn Asn Ile Gln Lys
275 280 285

Leu Ile Arg Ala Met Pro Arg Gly Ser Glu Tyr Tyr Val Ser Cys Ser
290 295 300

Ala Val Asn Thr Leu Pro Pro Ile Ile Phe Thr Ile Lys Gly Ile Asn
305 310 315 320

Tyr Pro Val Pro Ala Gln Ala Tyr Ile Leu Lys Asp Ser Arg Gly His
325 330 335

Cys Tyr Thr Thr Phe Lys Glu Asp Arg Leu Ser Pro Pro Ser Thr Glu
340 345 350

Thr Trp Ile Leu Gly Asp Val Phe Leu Arg Arg Tyr Phe Ser Val Phe
355 360 365

Asp Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 51
<211> 1154
<212> DNA
<213> bovidae

<400> 51
aggaaagaag catgaagtgg cttgtggtcc tcggacttgt ggccttctca gagtgcatag 60
tcaaaatacc tctaaggaga gtgaagacca tgagaaaagc cctcagtgga aaaaacatgc 120
tgaacaattt cctgaaggaa catgcttaca gactgtccca gatttctttt cgtggctcaa 180
atctaactag tcacccgctg agaaacatca aggatttggt ctacctggct aatatcacca 240
ttggaacacc ccctcaggag ttccaggttt tccttgacac aggctcatct gacttgtggg 300
tgccctctga ctttgcacc agcccaggct gttctaaaca cgttagattc agacatcttc 360
agtcttccac cttccggctt accaataaga ccttcagcat cacctatgga tctgggagaa 420
ttaaaggagt tgttgctcat gacacagttc ggattgggga ccttgtaagc actgaccagc 480
cgttcagtct aagcatggca gaatacgggc ttgagcatat acctttgat ggcatcttgg 540
gcttgaacta ccccaacgta tcttcttctg gagcaatccc tatctttgac aagctgaaga 600
atcaaggtgc catttctgaa cctgtttttg ccttctactt gagcaaagac aagcaggagg 660
gcagtgtggt gatgtttggt ggggtggacc atcgctatta caggggaaag ctcaactggg 720
taccattgat ccaagcggga aactggatta tacacatgga cagcatctcc attgaaagaa 780
aggttattgc ttgttctgga ggctgcgtgg cctttgttga catcgggaca gcattcatcg 840
aaggcccaaa accactggtc gataacatgc agaagctcat cagggccaag ccatggcgtt 900
ccaagcacta tgtttcatgt tctgcggtca atacactgcc ctctattacc ttcaccatca 960
acggcatcaa ctacccagtg ccaggtcgag cctacatcct caaggattct agacgccgtt 1020
gctatagcac ctttaaagag atcccattga gtccaactac agagttctgg atgctgggtg 1080
acgtcttcct gaggctgtat ttctcagtct ttgatcgagg aaatgacagg attgggctgg 1140
cacgggcagt gtaa 1154

<210> 52
<211> 380
<212> PRT
<213> bovidae

<400> 52
Met Lys Trp Leu Val Val Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Ala Leu Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu His Ala Tyr Arg Leu
35 40 45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Ser His Pro Leu Arg
50 55 60

Asn Ile Lys Asp Leu Val Tyr Leu Ala Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Phe Leu Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Asp Phe Cys Thr Ser Pro Gly Cys Ser Lys His Val Arg
100 105 110

120

Phe Arg His Leu Gln Ser Ser Thr Phe Arg Leu Thr Asn Lys Thr Phe
115 120 125

Ser Ile Thr Tyr Gly Ser Gly Arg Ile Lys Gly Val Val Ala His Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Ser Leu
145 150 155 160

Ser Met Ala Glu Tyr Gly Leu Glu His Ile Pro Phe Asp Gly Ile Leu
165 170 175

Gly Leu Asn Tyr Pro Asn Val Ser Ser Ser Gly Ala Ile Pro Ile Phe
180 185 190

Asp Lys Leu Lys Asn Gln Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Asp Lys Gln Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Arg Tyr Tyr Arg Gly Lys Leu Asn Trp Val Pro Leu Ile
225 230 235 240

Gln Ala Gly Asn Trp Ile Ile His Met Asp Ser Ile Ser Ile Glu Arg
245 250 255

Lys Val Ile Ala Cys Ser Gly Gly Cys Val Ala Phe Val Asp Ile Gly
260 265 270

Thr Ala Phe Ile Glu Gly Pro Lys Pro Leu Val Asp Asn Met Gln Lys
275 280 285

Leu Ile Arg Ala Lys Pro Trp Arg Ser Lys His Tyr Val Ser Cys Ser
290 295 300

Ala Val Asn Thr Leu Pro Ser Ile Thr Phe Thr Ile Asn Gly Ile Asn
305 310 315 320

Tyr Pro Val Pro Gly Arg Ala Tyr Ile Leu Lys Asp Ser Arg Arg Arg
325 330 335

Cys Tyr Ser Thr Phe Lys Glu Ile Pro Leu Ser Pro Thr Thr Glu Phe
340 345 350

Trp Met Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 53
<211> 1154
<212> DNA
<213> bovidae

<400> 53
aggaaagaag catgaagtgg cttgtgctcc tcggtctggt ggccttctca gagtgcatat 60
tcaaaatacc tctaaggaga gtgaagacca tgagaaaaac cctcagtgga aaaaacatgc 120
tgaacaattt cctgaaggag catccttaca aactgtccca gatttctttt cgtggctcaa 180
atctaaccac tctcccactg aggaacatct gggatatatt ctacataggt accatcacca 240
ttggaacacc ccctcaggaa ttccaggttg tctttgacac agcctcatct gacttgtggg 300
tgccctccat catttgcaac agctcaacct gttctacaca cgttagattc agacatcgtc 360
agtcttccac cttccggctt accaataaga cgttcgggat cacgtatgga tctgggagaa 420
tgaaaggagt tgttgttcat gacacagttc ggattgggga ccttgtaagt actgaccagc 480
cattcggtct aagcgtggcg gaatacgggt ttgagggcag aagatttgat ggtgtcttgg 540
gcttgaacta ccccaacata tccttctcta aagccatccc catctttgat aagctgaaga 600
atgaaggtgc catttcagag cctgtttttg ccttctactt gagcaaagac aagcagaagg 660
gcagtgtggt gatgtttggt ggggtggacc accgctacta caaaggagag ctcaactggg 720
taccattgat ccgagcgggt gactggagtg tacacgtaga ccgcatcacc atgaaaggag 780
aggttattgg ttgttctgat ggctgcacgg ccatggtgga caccgggtca tcaaatatcc 840
aaggcccagg aagagtgatc gataacatac acaagctcat tggtgccaca ccacggggtt 900
ccaagcacta cgtttcatgt tctgcggtca gtgctctgcc ctctgttgtc ttcaccatca 960
atggcatcaa ctacccagtg ccagctcgag cctacgtcct caaggatttt acaggcaact 1020
gctacaccac ctttaaagag aaaagggtaa ggagatctac ggagttctgg atcctgggtg 1080
aagccttcct gaggctgtat ttctcggtct ttgatcgagg aaatgacagg attggcctgg 1140
cacgggcagt gtaa 1154

<210> 54
<211> 380
<212> PRT
<213> bovidae

<400> 54
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Phe Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu His Pro Tyr Lys Leu
35 40 45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Thr Leu Pro Leu Arg
50 55 60

Asn Ile Trp Asp Ile Phe Tyr Ile Gly Thr Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Ala Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Ile Ile Cys Asn Ser Ser Thr Cys Ser Thr His Val Arg
100 105 110

122

```
Phe Arg His Arg Gln Ser Ser Thr Phe Arg Leu Thr Asn Lys Thr Phe
        115                 120                 125

Gly Ile Thr Tyr Gly Ser Gly Arg Met Lys Gly Val Val Val His Asp
    130                 135                 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145                 150                 155                 160

Ser Val Ala Glu Tyr Gly Phe Glu Gly Arg Arg Phe Asp Gly Val Leu
                165                 170                 175

Gly Leu Asn Tyr Pro Asn Ile Ser Phe Ser Lys Ala Ile Pro Ile Phe
            180                 185                 190

Asp Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
        195                 200                 205

Tyr Leu Ser Lys Asp Lys Gln Lys Gly Ser Val Val Met Phe Gly Gly
    210                 215                 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile
225                 230                 235                 240

Arg Ala Gly Asp Trp Ser Val His Val Asp Arg Ile Thr Met Lys Gly
                245                 250                 255

Glu Val Ile Gly Cys Ser Asp Gly Cys Thr Ala Met Val Asp Thr Gly
            260                 265                 270

Ser Ser Asn Ile Gln Gly Pro Gly Arg Val Ile Asp Asn Ile His Lys
        275                 280                 285

Leu Ile Gly Ala Thr Pro Arg Gly Ser Lys His Tyr Val Ser Cys Ser
    290                 295                 300

Ala Val Ser Ala Leu Pro Ser Val Val Phe Thr Ile Asn Gly Ile Asn
305                 310                 315                 320

Tyr Pro Val Pro Ala Arg Ala Tyr Val Leu Lys Asp Phe Thr Gly Asn
                325                 330                 335

Cys Tyr Thr Thr Phe Lys Glu Lys Arg Val Arg Arg Ser Thr Glu Phe
            340                 345                 350

Trp Ile Leu Gly Glu Ala Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
        355                 360                 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
    370                 375                 380
```

<210> 55
<211> 1320
<212> DNA
<213> bovidae

<400> 55
gtcgacggaa agaagcatga agtgggttgt gctccttggg ctggtggcct tctcagagtg 60
catagtcaaa atacctctaa ggcgagtgaa gaccatgaga aaaaccctca gtggtaaaaa 120
catgctgaac aatttcttga aggagcatgg taacagattg tccaagattt cttttcgtgg 180
ctcaaatcta actactctcc cgctgagaaa catcgaggat ttgatgtacg tgggtaacat 240
caccattgga acacccccac aggaattcca ggttgtcttt gatacaggct catctgactt 300
ttgggtgccc tccgactttt gcactagtcc agactgtatt acacacgtta gattcagaca 360
acatcagtct tccaccttcc ggcctaccaa taagaccttc agcatcacct atggatctgg 420
gagaatgaga ggagttgttg ttcatgacac agttcggatt ggggaccttg taagtactga 480
ccagccgttc ggtctaagcg tgtcagaata cgggtttaag gacagagctt atgatggcat 540
cctgggcttg aactaccccg acgaatcctt ctctgaagcc atccccatct ttgacaagct 600
aaagaatgaa ggtgccattt ctgagcctat ttttgccttc tacttgagca aaaaaaagcg 660
ggagggcagt gtggtgatgt ttggtggggt ggaccaccgc tactacaagg gagagctcaa 720
ctgggtacca ttgatcgaag agggtgactg gagtgtacgc atggacggca tctccatgaa 780
aacaaaggta gttgcttgtt ctgacggctg cgaggctgtt gttgacactg ggacatcact 840
gataaaaggc ccaagaaaac tggtcaataa aatacagaag ctcattggtg ccacgccacg 900
gggttccaag cactacgttt attgttctgc ggtcaatgct ctgccctcta ttatcttcac 960
catcaatggc atcaactacc cagtgccagc tcgagcctac attctcaagg attctagagg 1020
ccgctgctat accgccttta aaaagcaacg attcagttca tctacagaga cctggctcct 1080
gggtgacgcc ttcctgaggg tgtatttctc ggtctttgat cgaggaaatg gcaggattgg 1140
cctggcacag gcagtgtaaa tgcttggagt ggttcaagaa tcagtaaggc cgcttntaac 1200
acacactcac tcacactagg gcactcctgc ccaggatggt ggtgaactgt atttggtggt 1260
ctgtacaccc tattctcagt gaagaataaa cggtttcact cttaatggtg ctgaaaaaaa 1320

<210> 56
<211> 380
<212> PRT
<213> bovidae

<400> 56
Met Lys Trp Val Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu His Gly Asn Arg Leu
35 40 45

Ser Lys Ile Ser Phe Arg Gly Ser Asn Leu Thr Thr Leu Pro Leu Arg
50 55 60

Asn Ile Glu Asp Leu Met Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Asp Phe Trp
85 90 95

Val Pro Ser Asp Phe Cys Thr Ser Pro Asp Cys Ile Thr His Val Arg
100 105 110

Phe Arg Gln His Gln Ser Ser Thr Phe Arg Pro Thr Asn Lys Thr Phe
115 120 125

Ser Ile Thr Tyr Gly Ser Gly Arg Met Arg Gly Val Val Val His Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145 150 155 160

Ser Val Ser Glu Tyr Gly Phe Lys Asp Arg Ala Tyr Asp Gly Ile Leu
165 170 175

Gly Leu Asn Tyr Pro Asp Glu Ser Phe Ser Glu Ala Ile Pro Ile Phe
180 185 190

Asp Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Ile Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Lys Lys Arg Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile
225 230 235 240

Glu Glu Gly Asp Trp Ser Val Arg Met Asp Gly Ile Ser Met Lys Thr
245 250 255

Lys Val Val Ala Cys Ser Asp Gly Cys Glu Ala Val Val Asp Thr Gly
260 265 270

Thr Ser Leu Ile Lys Gly Pro Arg Lys Leu Val Asn Lys Ile Gln Lys
275 280 285

Leu Ile Gly Ala Thr Pro Arg Gly Ser Lys His Tyr Val Tyr Cys Ser
290 295 300

Ala Val Asn Ala Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Ile Asn
305 310 315 320

Tyr Pro Val Pro Ala Arg Ala Tyr Ile Leu Lys Asp Ser Arg Gly Arg
325 330 335

Cys Tyr Thr Ala Phe Lys Lys Gln Arg Phe Ser Ser Ser Thr Glu Thr
340 345 350

Trp Leu Leu Gly Asp Ala Phe Leu Arg Val Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Gly Arg Ile Gly Leu Ala Gln Ala Val
370 375 380

SEQUENCE LISTING

<110> Roberts, R. Michael
Green, Jonathan
Xie, Sancei

<120> COMPOSITIONS AND METHODS FOR EARLY PREGNANCY DIAGNOSIS

<130> UVMO003/UVMO003p

<140> Unknown
<141> 1999-03-19

<150> 60/078,783
<151> 1998-03-20

<150> 60/106,188
<151> 1998-10-28

<160> 56

<170> PatentIn Ver. 2.0

<210> 1
<211> 1295
<212> DNA
<213> bovidae

<400> 1
cttggatcca ggaaataaac atgaagtggc ttgtgctcct cgggctggtg gccttctcag 60
agtgcatagt caaaatacct ctaaggagac tgaagaccat gagaaatgtc gtcagtggaa 120
aaaacatgct gaacaatttt ctgaaggagc atgcttacag tctgtcccag atttcttttc 180
gtggctcaaa tctaactact cacccgctga gaaacatcaa ggatttggtc tacatgggta 240
acatcaccat tggaacaccc cctcaggaat tccaggttgt ctttgacaca gcctcatctg 300
acttgtgggt gccctccgac ttttgcacta gtccagcctg ttctacacac gttaggttca 360
gacatcttca gtcttccact ttccggctta ccaataagac cttcaggatc acctatggat 420
ctgggagaat gaaaggagtt gttgttcatg acacagttcg gattgggaac cttgtaagta 480
ctgaccagcc atttggtcta agcattgagg aatacgggtt tgagggcaga atttatgatg 540
gtgtcttggg cttgaactac cccaacatat ccttctctgg agccatcccc atctttgaca 600
agctgaagaa tcaacgtgcc atttctgagc ctgtttttgc cttctacttg agcaaagatg 660
agcgggaggg cagtgtggtg atgtttggtg gggtggacca ccgctattat gagggagagc 720
tcaactgggt acccctgatc caagcaggcg actggagtgt acacatggac cgcatctcca 780
ttgaaagaaa gattattgct tgttctgatg gctgcaaggc ccttgtggac accgggacat 840
cagatatcgt aggtccaaga agactggtca ataacatcca taggctcatc ggtgccatac 900
cacggggttc cgagcactac gttccatgtt ctgaggtcaa taccctgccc tctattgtct 960
tcaccatcaa cggcatcaac tacccagtgc caggtcgagc ctacatcctc aaggatgata 1020
gaggccgctg ctataccacc tttcaagaga accgagtgag ttcatctaca gagacctggt 1080
acctgggtga cgtcttcctg agactgtatt tctcggtctt tgatcgagga aatgacagaa 1140

ttggcctggc acgggcagtg taaatgctta gagtggttca ggaatcagta aggccactcc 1200
taacacacac tcactcacac tttggcactc ctgcccagaa tgctggtgaa ctgtatttgg 1260
tggtcttcac actctattct tagtaaagaa taaag 1295

<210> 2
<211> 1258
<212> DNA
<213> bovidae

<400> 2
gaaagaagca tgaagtggct tgtgctcctc gggctggtgg ccctctcaga gtgcatagtc 60
attttgcctc taaagaaaat gaagaccttg cgagaaaccc tgagggaaaa aaacttgctg 120
aacaatttcc tggaggaaca agcttacaga ctgtccaaga atgactccaa aataactatt 180
cacccgctga ggaactatct ggatactgcc tacgtgggta acatcaccat tggaacaccc 240
cctcaggagt tccgggtcgt ctttgacaca ggctcagcta acttgtgggt gccctgcatc 300
acctgtacca gtccagcctg ttatacacac aaaaccttca atcctcaaaa ttcttcaagc 360
ttccgggaag taggctcgcc tatcaccatc ttctatggat ctgggataat tcagggattt 420
cttggctctg acaccgttcg gatcgggaac cttgttagcc ctgaacagtc gtttggccta 480
agcctggagg aatacgggtt tgattctcta ccctttgatg gtatcctggg cttggctttt 540
cccgccatgg gcatcgaaga taccatcccc atctttgaca acttgtggtc acacggtgcc 600
ttttctgagc ctgtcttcgc cttctacttg aacacaaaca agccagaggg cagtgtggtg 660
atgtttggtg gggtggacca ccgctactac aagggagagc tcaactggat accagtgtcc 720
caaactagcc attggcagat aagcatgaac aacatcagca tgaatgggac tgtgactgct 780
tgttcttgtg gatgtgaggc ccttttggac accgggacat caatgatcta cggcccaaca 840
aaactggtca ccaacatcca caagctcatg aacgccaggc ttgagaattc tgagtatgtg 900
gtttcatgtg atgctgtcaa gaccctgcct cctgtcatct tcaacatcaa tggcatcgac 960
tatccactgc gccctcaagc ctacatcatc aagattcaaa acagctgccg cagcgtcttt 1020
caaggaggca cagaaaatag ctctctaaac acctggatcc ttggtgatat cttcctgagg 1080
cagtacttct cggtttttga tcgtaaaaat agaaggattg gcctggctcc ggcagtgtaa 1140
atgcttggac tatcagcaag catttgacta aatcagtcag gctgctccta acacacactc 1200
gctcacacta ggcactcctg ccagcgatgc tggtgaattg tgtttggtgc tgcaaacc 1258

<210> 3
<211> 1266
<212> DNA
<213> bovidae

<400> 3
ggcttgtgct cctcgggctg gtggccttct cagagtgcat agtcaaaata cctctaagga 60
gagtgaagac catgagaaat accgtcagtg gaaaaaacat actgaacaat atcctgaagg 120
agcatgttta cagactgtcc cagatttctt ttcgtggctc aaatctaact actcacccgc 180
tgagaaacat caaggatttg atatacgtgg gtaacatcac cattggaaca ccccctcagg 240
aattccaggt tgtctttgac acaggctcat ctgacttttg ggtgccctct gacttttgca 300
ctagtcgagc ctgttctaca cacgttaggt tcagacatct tcagtcttcc accttccggc 360
tcaccaataa gaccttcagg atcacctatg gatctgggag aatgaaagga gttgttgctc 420
atgacacagt tcggattggg gaccttgtaa gtactgacca accgtttggt ctaagtgtgg 480
aggaatatgg gtttgagggc agagcttatt atgatggtgt cttgggcttg aactacccca 540
acatatcctt ctctggagcc atccccatct ttgacaacct gaagaatcaa ggtgccattt 600

ctgagcctgt ttttgccatt ctactgagca aagacgagca ggagggcagt gtggtgatgt 660
ttggtggggt ggaccaccgc tactatgagg gagagctcaa ctgggtacca ttgattgaag 720
cgggtgactg gattatacac atggaccgca tctccatgaa aagaaagatt attgcttgtt 780
ctggcagctg cgaggccatt gttgacactg ggacatcagc aatagaaggc ccaagaaaac 840
tggtaaataa gatacacaag ctcatcggcg ccaggccacg gcattccaag tactacattt 900
catgttctgc ggtcaatacc ctgccttcta ttatcttcac catcaacggc atcaactacc 960
catgtccagg tcgagcctac gtgctcaagg attctagagg ccgctgctat tccatgtttc 1020
aagagaacaa agtgagttca tctacagaga cctggatcct gggcgatgtc tttctgaggg 1080
tgtatttctc agtctttgat cgaggaaatg acaggattgg cctggcacga gcagtgtaaa 1140
tgcttggagt ggttcaggaa tcagtaaggc cgctcctaac acacactcac tcacactagg 1200
cactcctgcc caggatggtg gtgaactgta tttggtggtc tgtacaccct attctctcgt 1260
gccgtt 1266

<210> 4
<211> 1359
<212> DNA
<213> bovidae

<400> 4
acaaaaaccc tcagtggaaa aaacatgctg aacaatttcg tgaaggagca tgcttacaga 60
ctgtcccaga tttcttttcg tggctcaaat ctaactattc acccgctgag aaacatcagg 120
gatttttttct atgtgggtaa catcaccatt gggacacccc ctcaggaatt ccaggttatc 180
tttgacacag gctcatctga gttgtgggtg ccctccatct tttgcaacag ctcaacctgt 240
tctaaacacg ataggttcag acatcttgag tcttctacct tccggcttag caggaggacc 300
ttcagcatca cctatggatc tgggagaatt gaagcacttg ttgttcatga cacagttcgg 360
attggggacc ttgtaagtac tgatcagcag ttcggtctat gcctagaaga atctgggttt 420
gagggcatga gatttgatgg cgtcttgggc ttgagctata ccaacatatc cccctctgga 480
gccatcccca tcttttacaa gctgaagaat gaaggtgcca tttctgaacc tgtttttgcc 540
ttctacttga gcaaagatga gcgggagggc agtgtggtga tgtttggtgg ggcggaccac 600
cgctactaca agggagagct caactggata ccattgatga aagcaggcga ctggagtgta 660
cacatggacc gcatctccat gaaaagaaag gttattgctt gctctggcgg ctgcaaggcc 720
cttgtggaca cggggtcatc agatatcgta ggcccaagta cactggtcaa taacatctgg 780
aagctcatcg gtgccacgcc acagggttct gagcactacg tttcatgttc tgcggtcaat 840
agcctaccct ctattatctt caccatcaaa agcaacaact accgagtgcc aggtcaagcc 900
tacatcctca aggattctag aggccgctgc tttactgcct ttaaagggca tcaacagagt 960
tcatctacag agatgtggat cctgggtgac gtctttctga ggctgtattt ctcagtcttt 1020
gatcgaagaa aggacagaat tggcctggcc accaaggtgt gaatgcttgg agtggttcag 1080
gaatcagtaa ggccactcct aacacacact cactcacact ttgggcactc ctgcccaagg 1140
aatgctggtg aactgtaatt tggtggtctg tacaccctat tctctgggaa gaaggcaatg 1200
gcaccccact ccagtactct tgcctggaaa atcacatgga cagaagcctg gtgggctcca 1260
gtccatgggg tttctaagag tcgggcaata actgagcacc ttcacttata ctttcacttt 1320
acaccctatt ctcaataaaa gataaatggt ttcactctt 1359

<210> 5
<211> 1317
<212> DNA
<213> bovidae

<400> 5
ccctgagtac ttggagccag gaaagaagta tgaagtggct tgtgctcctt gggctgctga 60
cctcctcaga gtgcatagtc atcctacctc taacaaaagt gaagaccatg agaaaaaccc 120
tcagtgaaaa aaacatgctg aacaatttcc tgaaggaaca ggcttacaga ctgtcccaga 180
tttcttctcg tggctcaaat ataactattc atcccctgag gaacatcatg gatatggtct 240
atgtgggtaa aatcaccatt ggaacacccc ctcaggaatt ccaggttgtc tttgacacag 300
gctcatctga gttgtgggtg ccctccgtct tttgccccag ttcagcctgt tctactcaca 360
ttaggttcag acatcttgag tcttccactt ccggcctaac ccaaaagacc ttcagcatca 420
cctatggatc tgggagcacg aagggatttc ttgcttatga caccgttcgg attggggacc 480
ttctaagtac tgatcaggaa ttcggactaa gcatggaaga acacgggttt gaggatctac 540
cttttgatgg cgtcttgggc ttgaactacc ctgacatgtc cttcataaca accatcccca 600
tctttgacaa cctcaagaat caaggtgcct tttctgagcc tgtttttgcc ttctacttgg 660
gcaaggtgaa gggcagtgtg gtgatgtttg gtggggtgga ccacacctac tacaagggag 720
agctcaactg ggtgccattg atccaggcag gtgagtggag tctacacatg gaccgcatct 780
ccatgaaaag aaaggttatt gcttgttctg gtggctgcga ggccttctat gacactggaa 840
catcactgat ccttggccca agaagactgg tcaataacat ccagaagctc atcggtgcca 900
cgccacaggg ttccgagcac tacatttcat gttttgctgt catatccctg ccctctatta 960
tcttcaccat caacggcatc aacatcccag tgccagctcg agcctacatc cacaaggatt 1020
ctagaggcca ctgctatccc acctttaaag agaacacagt gagtacatcc acagagacct 1080
ggatcctggg tgacgtcttc ctgaggctct atttctcagt ttttgatcga ggaaatgaca 1140
ggattggcct ggcacaggtg taaatgcttg gagtggttca ggaatcagta aggccgctcc 1200
taacacacac tcactcacac tttgagactc ctgcccagga tgctggtgaa ctgtatttgg 1260
tggtctgcac accctattct caggaaagaa taaagggttt cactcttaat ggtgctg 1317

<210> 6
<211> 1322
<212> DNA
<213> bovidae

<400> 6
ggagccagaa aatcacatga agtggcttgt gctcctcggg ctggtggcct tctcagagtg 60
catagtcaaa atacctctaa ggagagtgaa gacaatgaga aatgctatca gtggaaaaaa 120
cacgctgaac aatatcctga aggagcatgc ttacagactg ccccagattt cttttcgtgg 180
ctcaaatcta actcacccac tgagaaacat cagggatttg ttctacgtgg gtaacatcac 240
cattgggaca ccccctcagg aattccaggt tatctttgac acaggctcat ctgacttgtg 300
ggtggcctcc atcttttgca acagctcatc ctgtgctgca cacgttaggt tcagacatca 360
tcagtcttcc accttccggc ctaccaataa gaccttcagg atcacctatg gatctgggag 420
aatgaaagga gttgttgttc atgacacagt tcggattggg gaccttgtaa gtactgacca 480
gccattcggt ctatgcctga aagactctgg gtttaagggc atacctttg atggcatctt 540
gggcttgagc taccccaaca aaaccttctc tggagccttc cccatctttg acaagctgaa 600
gaatgaaggt gccatttctg agcctgtttt tgccttctac ttgagcaaag acaagcagga 660
gggcagtgtg gtgatgtttg gtggggtgga ccaccgctac tacaaggggg agctcaactg 720
ggtaccattg atccaagtgg gtgactggtt tgtacacatg gaccgcacta ccatgaaaag 780
aaaggttatt gcttgttctg atggctgcaa ggcccttgtg gacaccggga catcagatat 840
cgtaggccca agtacactgg tcaataacat ctggaagctc atccgtgcca ggccactggg 900
tcctcagtac ttcgtttcat gttctgcggt caatacactg ccctctatta tcttcaccat 960
caacggcatc aactaccgac tgccagctcg agcctacatc cacaaggatt ctagaggccg 1020
ctgctatacc gcctttaaag agcaccgatt cagttcacct atagagacct ggctcctggg 1080

tgacgtcttc ctgaggcggt atttctcagt ctttgatcga ggaaatgaca ggattggcct 1140
ggcacgggca gtgtaaatgc ttagagtggc tcaggaatca gtaaggccgt tcctaacaca 1200
ccttaactca cactttgggc actcttgcct aggatgctgg tgaactgtat ttggtgctcg 1260
tacacccatt ctagtaaaga ataaagggtt tcacttaacg ggtgctgaaa aaaaaaaaaa 1320
aa 1322

<210> 7
<211> 1211
<212> DNA
<213> bovidae

<400> 7
acaccaaaac ttccctgagt acttggaacc aggaaagaag catgaagtgg cttgtgctcc 60
tcgggctggt ggccttctca gagtgcatag tcaaaatacc tctaaggaga gtgaagacca 120
tgagaaaaac tctcagtgga aaaaacatgc tgaacaattt cttgaaggag gatccttaca 180
gactgtccca catttctttt cgtggctcaa atctaactat tcacccgctg agaaacatca 240
gagatatctt ctatgtcgga aacatcacca ttggaacacc ccctcaggaa ttccaggtta 300
tctttgacac aggctcatct gacttgtggg tgccctcgat cgattgcaac agtacatcct 360
gtgctacaca tgttaggttc agacatcttc agtcttccac cttccggcct accaataaga 420
ccttcaggat catctatgga tctgggagaa tgaacggagt tattgcttat gacacagttc 480
ggattgggga ccttgtaagt accgaccagc catttggtct aagcgtggag gaatatgggt 540
ttgcgcacaa aagatttgat ggcatcttgg gcttgaacta ctggaaccta tcctggtcta 600
aggccatgcc catctttgac aagctgaaga atgaaggtgc catttctgag cctgtttttg 660
ccttctactt gagcaacatc accatgaaca gagaggttat tgcttgttct gaaggctgtg 720
cggcccttgt ggacactggg tcatcaaata tccaaggccc aggaagactg attgataaca 780
tacagaggat catcggcgcc acgccacggg gttccaagta ctacgtttca tgttctgcgg 840
tcaatatcct gccctctatt atcttcacca tcaacggcgt caactaccca gtgccacctc 900
gagcttacat cctcaaggat tctagaggcc actgctatac caccttaaa gagaaaagag 960
tgaggagatc tacagagagc tgggtcctgg gtgaagtctt cctgaggctg tatttctcag 1020
tctttgatcg aggaaatgac aggattggcc tggcacggcg agtgtaaatg cttggtctgg 1080
ctcaagaatc attaaggcca ctcctaacac acactcactc acactttggg cactgctgcc 1140
aggatgctgg tgaactgtat ttgtgttctg tacaccctat tctcagtaaa gaataaaggg 1200
tttcagctct t 1211

<210> 8
<211> 1340
<212> DNA
<213> bovidae

<400> 8
caggaattcg cggccgcgtc gacggaaaga agcatgaagt ggcttgtgct tctcgggctg 60
gtggccctct cagagtgcat agtcaaaatc cctctaacga agatgaagac catgcaagaa 120
gccatcaggg aaaaacaatt gctggaagat ttcttggatg aacaacctca cagcctgtcc 180
cagcattctg atcctgacaa gaaattctct tctcaccaac tgaagaattt ccagaatgct 240
gtctactttg gtacgatcac cattggaaca cctcctcaag agttccaggt caactttgac 300
accggctcat ctgacttgtg ggtgccctct gtcgactgcc aaagtccctc ctgctctaaa 360
cataagagat tcgaccctca gaagtccacc accttccagc ctttgaacca gaaaattgaa 420
ctcgtctacg gctctgggac catgaaaggg gttcttggct ctgacaccat tcagatcggg 480

aaccttgtca tcgtgaacca gatttttggc ttgagccaga atcagtccag tggcgtcctg 540
gaacaagtac cttatgatgg catcctgggc ttggcctacc ccagcctcgc catccagggg 600
accaccccag tcttcgacaa cctgaagaat cgagaagtca tttctgagcc agtctttgcc 660
ttctacttga gctcccggcc agaaaacatc agcacggtga tgtttggcgg ggtggaccac 720
acctaccaca agggaaaact ccagtggatc ccagtgaccc aagcccgctt ctggcaggta 780
gccatgagca gcatgaccat gaacgggaat gtggtcggtt gttcccaagg atgtcaggcc 840
gttgtggata ctgggacctc gttgctggtt gggccaactc acctggtcac tgacatcctg 900
aagctcatca accctaatcc tatcctgaat gacgagcaaa tgctttcatg tgatgccatc 960
aatagcctgc ctacgctcct cctcaccatc aacggcatcg tctaccctgt gccccctgac 1020
tactacatcc agaggttttc tgaaaggatc tgctttatca gctttcaagg gggcacagag 1080
atcttgaaaa atttgggaac ctcggagacc tggatcctgg gtgatgtctt cctgaggctg 1140
tatttttcag tttatgaccg aggaaataac aggattggcc tggctcctgc agcataaatt 1200
cgggctgcta caggaatcaa tcagggccag acaaacacac actcactcac atgcagggcc 1260
atcccaccca gggatgctgg tgaactatgc ctgatgctct gcaaagccgt attctcagta 1320
aagaataaaa gattcatttc 1340

<210> 9
<211> 1311
<212> DNA
<213> bovidae

<400> 9
accccaaact tccctgagta cctggagcca gtaaagaagc atgaagtgga ttgtgctcct 60
cgggctggtg gccttctcag agtgcatagt caaaatacct ctaaggcaag tgaagaccat 120
gagaaaaacc ctcagtggaa aaaacatgct gaagaatttc ttgaaggagc atccttacag 180
actgtcccag atttcttttc gtggctcaaa tctaactatt cacccgctga ggaacatcat 240
gaatttggtc tacgtgggta acatcaccat tggaacaccc cctcaggaat tccaggttgt 300
ctttgacaca ggctcatctg acttgtgggt gccctccttt tgtaccatgc cagcatgctc 360
tgcaccggtt tggttcagac aacttcagtc ttccaccttc cagcctacca ataagacctt 420
caccatcacc tatggatctg ggagcatgaa gggatttctt gcttatgaca cagttcggat 480
tggggacctt gtaagtactg atcagccgtt cggtctaagc gtggtggaat atgggttgga 540
gggcagaaat tatgatggtg tcttgggctt gaactacccc aacatatcct tctctggagc 600
catccccatc tttgacaacc tgaagaatca aggtgccatt tctgagcctg tttttgcctt 660
ctacttgagc aaaaacaagc aggagggcag tgtggtgatg tttggtgggg tggaccacca 720
gtactacaag ggagagctca actggatacc actgattgaa gcaggcgaat ggagagtaca 780
catggaccgc atctccatga aaagaacggt tattgcttgt tctgatggct gtgaggccct 840
tgtgcacact gggacatcac atatcgaagg cccaggaaga ctggtgaata acatacacag 900
gctcatccgc accaggccat ttgattccaa gcactacgtt tcatgttttg ccaccaaata 960
cctgccctct attactttca tcatcaacgg catcaagtac ccaatgacag ctcgagccta 1020
catctttaag gattctagag gccgctgcta ttccgctttt aaagagaaca cagtgagaac 1080
atctagagag acctggatcc tcggtgatgc cttcctgagg cggtatttct cagtctttga 1140
tcgaggaaat gacaggattg gcctggcacg ggcagtgtaa atgcttagag tggttcagga 1200
atcagtaagg ccgttcctaa cacacactaa ctcacacttt gggcactctt gcctaggatg 1260
ctggtgaacc tgtctttggt ggtcttgtac caccctattc tcagtaaaga a 1311

<210> 10
<211> 1328
<212> DNA

<213> bovidae

<400> 10
tccgactctg tcttgagcac ttcagtggag gacaaaagca tgaagtggct tggacttctc 60
gggctggtag ctctctcaga gtgcatggtc ataatccctc ttaggcaaat gaagaccatg 120
cgagaaaccc taagggaaag acatttgctg acaaatttct ctgaggaaca cccttacaac 180
ctgtcccaga aagctgctaa tgatcaaaac ataatttatc atcatccctt gaggagctat 240
aaggattttt cctacatcgg caacatcaac attggaacac cccctcagga gttccaggtc 300
ctctttgaca ccggctcatc tagcttgtgg gtgccctcca tatactgcca gagttccagc 360
tgctataaac acaatagctt cgtcccttgt aactcctcca ccttcaaggc cacgaacaag 420
atcttcaata ccaactacac cgctacatcg ataaagggat atcttgtcta tgacactgtt 480
cggatcggga accttgttag tgtggcccag ccatttggcc taagcctgaa ggagtttggg 540
tttgacgatg taccatttga tggcatcctg ggactaggtt acccacgccg cactatcaca 600
ggggccaacc cgatcttcga caacctgtgg aaacaaggag tcatttctga gcctgtcttt 660
gccttctact tgagcagtca gaaagagaac ggcagcgtgg tgatgtttgg aggggtgaac 720
cgtgcctact ataagggaga actcaactgg gtaccagtgt cccaagtggg cagctggcat 780
ataaacatag acagcatctc catgaatggg acagtggttg cttgtaaacg tggctgccag 840
gcctcttgga tacggggacg cctttctgcg tggcccaaga ggatcgtcag caaaatccag 900
aaactcatcc atgccaggcc catcgatcgt gagcacgtgg tttcctgcca agccatcggg 960
acactgcctc ctgctgtctt cactatcaat gggatagact atccagtacc cgcccaagct 1020
tacatccaaa gtttgtcggg ctactgcttc agcaactttc ttgtgcgccc acagcgtgtg 1080
aacgagtcgg agacctggat cctgggtgac gtcttcctga ggctgtattt ctcagttttc 1140
gatcgaggaa acaacaggat tggcctggct cccgcagtgt aaatgctggg ctacttcagg 1200
aatcaatcag gcccactcca aacacatact catgtgaggg caccctgggt ggggccaggg 1260
atgctggtga actctgtttg ttgcgctgca aagccctact ctctatagag aataaaggat 1320
ttcatctc 1328

<210> 11
<211> 1285
<212> DNA
<213> bovidae

<400> 11
gagatgaagt ggcttgtgtt ccttgggctg gtggccttct cagagtgcat agtcataatg 60
cttctaacta aaacgaagac aatgcgagaa atctggaggg aaaaaaaatt gctgaacagt 120
ttcctggagg aacaagccaa tagaatgtcc gatgattctg ctagtgaccc caaattatct 180
actcaccccc tgaggaacgc tctggatatg gcctatgtgg gtaacatcac cattggaaca 240
ccccctaagg agttccgggt tgtctttgac acgggctcat ctgacttgtg ggtgccctcc 300
atcaagtgca tcagtcctgc ctgtcataca catattacct tcgaccatca caaatcttcc 360
accttccggc ttacgcgcag gcccttccac atcctctacg gatctgggat gatgaacgga 420
gttcttgcct atgacactgt tcggatcggg aaacttgtca gcactgacca gccgtttggc 480
ctaagcctgc agcaattcgg gtttgataat gcacccttg atggtgtcct gggcttgtcc 540
taccccagcc tcgctgtccc aggaaccatc cccatctttg acaagctgaa gcaacaaggt 600
gccatttctg aacctatctt tgccttctac ttgagcaccc gcaaggagaa tggcagtgtg 660
ttgatgttag gtggggtgga ccactcctac cacaagggaa agctcaactg gataccagtg 720
tcccaaacca aaagctggct aataactgtg gaccgcatct ccatgaatgg gagagtgatt 780
ggctgtgaac acggctgcga ggctcttgtg gataccggga catcactgat ccatggccca 840
gcaagaccag tcaccaacat ccaaaagttc atccacgcta tgccctacgg ttccgagtac 900

atggttttgt gtcctgtcat cagtatcctg cctcctgtca tcttcaccat caatggcatc 960
gattactcag tgcctcgtga agcctacatc caaaagattt ctaatagctt atgccttagc 1020
acctttcatg gggacgacac agaccaatgg atcctgggtg acgtcttcct gaggctgtat 1080
ttctcagttt atgaccgagg aaataacagg attggcctgg ctcctgctgt gtaaatgctt 1140
ggacttgttc aggaatcatt caggccagtc ctaacacaca cttgctcaca ctttagactc 1200
ctgcccagga tgctggtaaa ctgtgtttgg tgctctgaaa gtcatattct cactgaaaaa 1260
taaaaggttt cactcttaac atctt 1285

<210> 12
<211> 1130
<212> DNA
<213> bovidae

<400> 12
atgaagtggc ttgtgctcct cgggctggtg gccctctcag agtgcatagt cattttgcct 60
ctaaggaaaa tgaagacctt gcgagaaacc ctgagggaaa aaaacttgct gaacaatttc 120
ctggaagaac gagcttacag actgtccaag aaagactcca aaataactat tcaccccctt 180
aaaactatct ggatatggcc tacgtgggta atatcaccat tggaacaccc cctcaggaat 240
tccgggtcgt ctttgacaca ggctcagctg acttgtgggt gccttccatc agctgtgtca 300
gtccagcctg ttatacacac aaaaccttca atcttcacaa ttcttccagc ttcgggcaaa 360
cacaccagcc tattagcatc tcctatggac ctgggataat tcagggattt cttggctctg 420
acaccgttcg gatcgggaac cttgttagcc ttaaacagtc gtttggccta agccaggagg 480
aatatgggtt tgatggtgca ccctttgatg gcgtcctggg cttggcctac ccctccatca 540
gcatcaaagg tatcatcccc atctttgaca acttgtggtc gcaaggtgcc ttttctgaac 600
ctgtctttgc cttctacttg aacacatgcc agccggaagg cagtgtggtg atgtttggtg 660
gagtggacca ccgctactac aagggagagc tcaactggat accagtgtcc caaactcgct 720
actggcagat aagcatgaac cgcatcagca tgaacgggaa tgttactgct tgttctcgtg 780
gatgtcaggc ccttttggac accgggacat caatgatcca tggcccaaca agactgatca 840
ccaacatcca caagctcatg aacgccaggc accagggttc ggagtatgtg gtttcatgtg 900
atgccgtcaa gaccctgcct cctgtcatct tcaacatcaa tggcatcgac tatccactgc 960
cccctcaagc ctacatcacc aaggctcaaa acttctgcct tagcatcttt catgggggca 1020
cagaaactag ctctccagag acctggatcc tgggtggcgt cttcctgaga cagtacttct 1080
cagtttttga tcgaagaaat gacagtattg gcctggcaca ggtgtaaatg 1130

<210> 13
<211> 1173
<212> DNA
<213> bovidae

<400> 13
cccaagctta tgaagtggct tgtgctcctc gggctggtgg ccctctcaga gtgcatagtc 60
attttgcctc taaagaaaat gaagaccttg cgagaaaccc tgagggaaaa aaacttgctg 120
aacaatttcc tggaggaaca agcttacaga ctgtccaaga atgactccaa aataactatt 180
cacccctga ggaactatct ggatactgcc tacgtgggta acatcaccat tggaacaccc 240
cctcaggagt tccgggtcgt ctttgacaca ggctcagcta acttgtgggt gccctgcatc 300
acctgtacca gtccagcctg ttatacacac aaaaccttca atcctcaaaa ttcttcaagc 360
ttccgggaag taggctcgcc tatcaccatc ttctatggat ctgggataat tcagggattt 420
cttggctctg acaccgttcg gatcgggaac cttgttagcc ttaaacagtc gtttggccta 480

agccaggagg aatatgggtt tgatggtgca ccctttgatg gcgtcctggg cttggcctac 540
ccctccatca gcatcaaagg tatcatcccc atctttgaca acttgtggtc gcacggtgcc 600
ttttctgagc ctgtcttcgc cttctacttg aacacaaaca agccagaggg cagtgtggtg 660
atgtttggtg gggtggacca ccgctactac aagggagagc tcaactggat accagtgtcc 720
caaactagcc attggcagat aagcatgaac aacatcagca tgaatgggac tgtgacggct 780
tgttcttgtg gatgtgaggc ccttttggac accgggacat caatgatcta cggcccaaca 840
aaactggtca ccaacatcca caagctcatg aacgccaggc ttgagaattc tgagtatgtg 900
gtttcatgtg atgctgtcaa gaccctgcct cctgtcatct tcaacatcaa tggcatcgac 960
tatccactgc gccctcaagc ctacatcatc aagattcaaa acaactgccg cagcgtcttt 1020
caaggaggca cagaaaatag ctctctaaac acctggatcc ttggtgatat cttcctgagg 1080
cagtacttct cggtttttga tcgtaaaaat agaaggattt gctggcacag gtgggtaccg 1140
actacaagga cgacgatgac aagtaagctt ccg 1173

<210> 14
<211> 1176
<212> DNA
<213> bovidae

<400> 14
cccaagctta tgaagtggct tgtgctcctt gcgctggtgg ccttctcaga gtgcataatc 60
aaaatacctc taaggagagt gaagaccatg agcaataccg ccagtggaaa aaacatgctg 120
aacaatttcc tgaagaagca tccttacaga ttgtcccaga tttcttttcg tggctcaaat 180
ctcactactc acccactgat gaacatctgg gatttgctct acctgggtaa catcaccatt 240
ggaacacccc ctcaggaatt ccaggttctc tttgacacag gctcatctga cttgtgggtc 300
ccctctctct tgtgcaacag ctcaacctgt gctaaacacg ttatgttcag acatcgtctg 360
tcttccacct accggcctac caataagacc ttcatgatct tctatgcagt tgggaaaatt 420
gaaggagttg ttgttcgtga cacagttcgg attggggacc ttgtaagtgc ggaccagacg 480
tttggtctaa gcattgcaga aactgggttt gagaacacaa ctcttgatgg catcttgggc 540
ttgagctacc ccaacacatc ctgctttgga accatcccca tctttgacaa gctgaagaat 600
gaaggtgcca tttctgagcc tgtactacat agtgtgagac gcaaagatga gcaggagggc 660
agtgtagtga tgtttggtgg tgtggaccac agttactaca agggagagct caactgggta 720
ccattgatca aagcaggcga ctggagtgta cgtgtggaca gcatcaccat gaaaagagag 780
gttattgctt gttctgacgg ctgcagggcc ctggtggaca ccggttcatc acatatccaa 840
ggcccaggaa gactgatcga taacgtacag aagctgatag gcaccatgcc acagggatcc 900
atgcactatg ttccatgttc tgcggtcaat accctgccct ctattatctt caccatcaac 960
agcatcagct acacagtgcc agctcaagcc tacatcctca agggttctag gggccgctgc 1020
tattccacct ttcaagggca cactatgagt tcatctacag agacctggat cctgggtgat 1080
gtcttcctga gtcagtattt ctcggtcttt gatcgaggaa atgacaggat tggcctggca 1140
caggtgggta ccgactacaa ggacgacgat gaaagt 1176

<210> 15
<211> 1360
<212> DNA
<213> Felis domestica

<400> 15
aggaaagaag catgaagtgg ctttgggtcc ttgggctggt ggccctctca gagtgcttag 60
tcacaatccc tctgacgagg gtcaagtcca tgcgagaaaa cctcagggag aaagacaggc 120

tgaaggattt cctggagaac catccttaca acctggccta caagtttgtt gactctgtaa 180
atctggacct ggggatatat tttgaaccga tgaggaacta cctggatctg gcctacgttg 240
gcaccatcag cattggaacg ccccccccagg agttcaaggt catctttgac accggctcat 300
ctgacttgtg ggtgccctcc atctactgct ctagccctgc ctgcgctaat cacaacgtct 360
tcaaccctct gcggtcctcc accttccgga tctcgggccg gcccatccac ctccagtacg 420
gctccgggac gatgtcagga tttctggcct acgacaccgt tcggttcggg ggcctcgttg 480
acgtggccca ggcgtttggc ctgagcctga gggagcccgg caagttcatg gaatacgcag 540
ttttcgacgg catcctgggc ctggcctacc ccagcctcag cctcagaggg accgtccctg 600
tcttcgacaa cctgtggaag cagggtctca tttctcagga gctctttgcc ttctacttga 660
gcaaaaagga cgaagaaggc agtgtggtga tgttcggcgg tgtggaccac tcctactaca 720
gcggagacct caactgggtg ccggtgtcca aacggctgta ctggcagtta tccatggaca 780
gcatctccat gaacggggaa gtcattgctt gtgacggtgg ctgccaggcc atcattgata 840
caggaacctc gctgctgatt ggcccatctc acgttgtctt caacatccag atgatcatcg 900
gcgccaacca gtcctacagc ggcgagtacg tagttgactg cgatgccgcc aacaccctgc 960
ccgacatcgt cttcaccatc aacggcatcg actacccggt gccagccagt gcctacatcc 1020
aggagggtcc tcagggcacc tgctacagcg gctttgacga gagcggagac agcttgttgg 1080
tctcagactc ctggatcctg ggcgatgtct tcctgaggtt gtatttcacc gtcttcgacc 1140
gagagaacaa caggattggc ctggccctgg cagtgtaaac actggggcca gctccaggaa 1200
gcaaccgtgc ccaccccaaa cccgcgcgcg cgtgtgcgca cacacacaca cacacacccc 1260
gcagtcaggg cattcctgcc caggggccgg cttgaactgt gtcttcggct ctgccaatcc 1320
cttctcccag tggagaataa aagacctcat cttccacggt 1360

<210> 16
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 16
cccaagctta tgaagtggct tgtgctcct 29

<210> 17
<211> 69
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 17
gggaagctta cttgtcatcg tcgtccttgt agtcggtacc cacctgtgcc aggccaatcc 60
tgtcatttc 69

<210> 18
<211> 21
<212> DNA

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 18
cctcttttgc cttctacttg a 21

<210> 19
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 19
gcgctcgagt tacactgccc gtgccaggc 29

<210> 20
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 20
tgggtaacat caccattgga a 21

<210> 21
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 21
tttctgagcc tgtttttgcc 20

<210> 22
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 22
tgggtaacat caccattgga ac 22

<210> 23
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 23
caaacatcac cacactgccc tcc 23

<210> 24
<211> 380
<212> PRT
<213> bovidae

<400> 24
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Leu Lys Thr Met Arg Asn Val Val Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu His Ala Tyr Ser Leu
35 40 45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Thr His Pro Leu Arg
50 55 60

Asn Ile Lys Asp Leu Val Tyr Met Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Ala Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Asp Phe Cys Thr Ser Pro Ala Cys Ser Thr His Val Arg
100 105 110

Phe Arg His Leu Gln Ser Ser Thr Phe Arg Leu Thr Asn Lys Thr Phe
115 120 125

Arg Ile Thr Tyr Gly Ser Gly Arg Met Lys Gly Val Val Val His Asp
130 135 140

Thr Val Arg Ile Gly Asn Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145 150 155 160

Ser Ile Glu Glu Tyr Gly Phe Glu Gly Arg Ile Tyr Asp Gly Val Leu
165 170 175

Gly Leu Asn Tyr Pro Asn Ile Ser Phe Ser Gly Ala Ile Pro Ile Phe
180 185 190

Asp Lys Leu Lys Asn Gln Arg Ala Ile Ser Glu Pro Val Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Asp Glu Arg Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Arg Tyr Tyr Glu Gly Glu Leu Asn Trp Val Pro Leu Ile
225 230 235 240

Gln Ala Gly Asp Trp Ser Val His Met Asp Arg Ile Ser Ile Glu Arg
245 250 255

Lys Ile Ile Ala Cys Ser Asp Gly Cys Lys Ala Leu Val Asp Thr Gly
260 265 270

Thr Ser Asp Ile Val Gly Pro Arg Arg Leu Val Asn Asn Ile His Arg
275 280 285

Leu Ile Gly Ala Ile Pro Arg Gly Ser Glu His Tyr Val Pro Cys Ser
290 295 300

Glu Val Asn Thr Leu Pro Ser Ile Val Phe Thr Ile Asn Gly Ile Asn
305 310 315 320

Tyr Pro Val Pro Gly Arg Ala Tyr Ile Leu Lys Asp Asp Arg Gly Arg
325 330 335

Cys Tyr Thr Thr Phe Gln Glu Asn Arg Val Ser Ser Ser Thr Glu Thr
340 345 350

Trp Tyr Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 25
<211> 376

<212> PRT
<213> bovidae

<400> 25

```
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Leu Ser Glu Cys Ile
  1               5                  10                  15

Val Ile Leu Pro Leu Lys Lys Met Lys Thr Leu Arg Glu Thr Leu Arg
             20                  25                  30

Glu Lys Asn Leu Leu Asn Asn Phe Leu Glu Glu Gln Ala Tyr Arg Leu
         35                  40                  45

Ser Lys Asn Asp Ser Lys Ile Thr Ile His Pro Leu Arg Asn Tyr Leu
     50                  55                  60

Asp Thr Ala Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro Pro Gln Glu
 65                  70                  75                  80

Phe Arg Val Val Phe Asp Thr Gly Ser Ala Asn Leu Trp Val Pro Cys
                 85                  90                  95

Ile Thr Cys Thr Ser Pro Ala Cys Tyr Thr His Lys Thr Phe Asn Pro
            100                 105                 110

Gln Asn Ser Ser Ser Phe Arg Glu Val Gly Ser Pro Ile Thr Ile Phe
        115                 120                 125

Tyr Gly Ser Gly Ile Ile Gln Gly Phe Leu Gly Ser Asp Thr Val Arg
    130                 135                 140

Ile Gly Asn Leu Val Ser Pro Glu Gln Ser Phe Gly Leu Ser Leu Glu
145                 150                 155                 160

Glu Tyr Gly Phe Asp Ser Leu Pro Phe Asp Gly Ile Leu Gly Leu Ala
                165                 170                 175

Phe Pro Ala Met Gly Ile Glu Asp Thr Ile Pro Ile Phe Asp Asn Leu
            180                 185                 190

Trp Ser His Gly Ala Phe Ser Glu Pro Val Phe Ala Phe Tyr Leu Asn
        195                 200                 205

Thr Asn Lys Pro Glu Gly Ser Val Val Met Phe Gly Gly Val Asp His
    210                 215                 220

Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Val Ser Gln Thr Ser
225                 230                 235                 240
```

```
His Trp Gln Ile Ser Met Asn Asn Ile Ser Met Asn Gly Thr Val Thr
                245                 250                 255

Ala Cys Ser Cys Gly Cys Glu Ala Leu Leu Asp Thr Gly Thr Ser Met
            260                 265                 270

Ile Tyr Gly Pro Thr Lys Leu Val Thr Asn Ile His Lys Leu Met Asn
        275                 280                 285

Ala Arg Leu Glu Asn Ser Glu Tyr Val Val Ser Cys Asp Ala Val Lys
    290                 295                 300

Thr Leu Pro Pro Val Ile Phe Asn Ile Asn Gly Ile Asp Tyr Pro Leu
305                 310                 315                 320

Arg Pro Gln Ala Tyr Ile Ile Lys Ile Gln Asn Ser Cys Arg Ser Val
                325                 330                 335

Phe Gln Gly Gly Thr Glu Asn Ser Ser Leu Asn Thr Trp Ile Leu Gly
            340                 345                 350

Asp Ile Phe Leu Arg Gln Tyr Phe Ser Val Phe Asp Arg Lys Asn Arg
        355                 360                 365

Arg Ile Gly Leu Ala Pro Ala Val
    370                 375
```

<210> 26
<211> 381
<212> PRT
<213> bovidae

<400> 26

```
Met Asp Asp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
  1               5                  10                  15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Asn Thr Val Ser
             20                  25                  30

Gly Lys Asn Ile Leu Asn Asn Ile Leu Lys Glu His Val Tyr Arg Leu
         35                  40                  45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Thr His Pro Leu Arg
     50                  55                  60

Asn Ile Lys Asp Leu Ile Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
```

65 70 75 80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Asp Phe Trp
85 90 95

Val Pro Ser Asp Phe Cys Thr Ser Arg Ala Cys Ser Thr His Val Arg
100 105 110

Phe Arg His Leu Gln Ser Ser Thr Phe Arg Leu Thr Asn Lys Thr Phe
115 120 125

Arg Ile Thr Tyr Gly Ser Gly Arg Met Lys Gly Val Val Ala His Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145 150 155 160

Ser Val Glu Glu Tyr Gly Phe Glu Gly Arg Ala Tyr Tyr Asp Gly Val
165 170 175

Leu Gly Leu Asn Tyr Pro Asn Ile Ser Phe Ser Gly Ala Ile Pro Ile
180 185 190

Phe Asp Asn Leu Lys Asn Gln Gly Ala Ile Ser Glu Pro Val Phe Ala
195 200 205

Ile Leu Leu Ser Lys Asp Glu Gln Glu Gly Ser Val Val Met Phe Gly
210 215 220

Gly Val Asp His Arg Tyr Tyr Glu Gly Glu Leu Asn Trp Val Pro Leu
225 230 235 240

Ile Glu Ala Gly Asp Trp Ile Ile His Met Asp Arg Ile Ser Met Lys
245 250 255

Arg Lys Ile Ile Ala Cys Ser Gly Ser Cys Glu Ala Ile Val Asp Thr
260 265 270

Gly Thr Ser Ala Ile Glu Gly Pro Arg Lys Leu Val Asn Lys Ile His
275 280 285

Lys Leu Ile Gly Ala Arg Pro Arg His Ser Lys Tyr Tyr Ile Ser Cys
290 295 300

Ser Ala Val Asn Thr Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Ile
305 310 315 320

Asn Tyr Pro Cys Pro Gly Arg Ala Tyr Val Leu Lys Asp Ser Arg Gly

325 330 335

Arg Cys Tyr Ser Met Phe Gln Glu Asn Lys Val Ser Ser Ser Thr Glu
340 345 350

Thr Trp Ile Leu Gly Asp Val Phe Leu Arg Val Tyr Phe Ser Val Phe
355 360 365

Asp Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 27
<211> 380
<212> PRT
<213> bovidae

<400> 27
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Thr Lys Thr Leu Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Val Lys Glu His Ala Tyr Arg Leu
35 40 45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Ile His Pro Leu Arg
50 55 60

Asn Ile Arg Asp Phe Phe Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Ile Phe Asp Thr Gly Ser Ser Glu Leu Trp
85 90 95

Val Pro Ser Ile Phe Cys Asn Ser Ser Thr Cys Ser Lys His Asp Arg
100 105 110

Phe Arg His Leu Glu Ser Ser Thr Phe Arg Leu Ser Arg Arg Thr Phe
115 120 125

Ser Ile Thr Tyr Gly Ser Gly Arg Ile Glu Ala Leu Val Val His Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Gln Phe Gly Leu
145 150 155 160

Cys Leu Glu Glu Ser Gly Phe Glu Gly Met Arg Phe Asp Gly Val Leu
165 170 175

Gly Leu Ser Tyr Thr Asn Ile Ser Pro Ser Gly Ala Ile Pro Ile Phe
180 185 190

Tyr Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Asp Glu Arg Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Ala Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Leu Met
225 230 235 240

Lys Ala Gly Asp Trp Ser Val His Met Asp Arg Ile Ser Met Lys Arg
245 250 255

Lys Val Ile Ala Cys Ser Gly Gly Cys Lys Ala Leu Val Asp Thr Gly
260 265 270

Ser Ser Asp Ile Val Gly Pro Ser Thr Leu Val Asn Asn Ile Trp Lys
275 280 285

Leu Ile Gly Ala Thr Pro Gln Gly Ser Glu His Tyr Val Ser Cys Ser
290 295 300

Ala Val Asn Ser Leu Pro Ser Ile Ile Phe Thr Ile Lys Ser Asn Asn
305 310 315 320

Tyr Arg Val Pro Gly Gln Ala Tyr Ile Leu Lys Asp Ser Arg Gly Arg
325 330 335

Cys Phe Thr Ala Phe Lys Gly His Gln Gln Ser Ser Ser Thr Glu Met
340 345 350

Trp Ile Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
355 360 365

Arg Arg Lys Asp Arg Ile Gly Leu Ala Thr Lys Val
370 375 380

<210> 28
<211> 377
<212> PRT
<213> bovidae

<400> 28

```
Met Lys Trp Leu Val Leu Leu Gly Leu Leu Thr Ser Ser Glu Cys Ile
  1               5                  10                  15

Val Ile Leu Pro Leu Thr Lys Val Lys Thr Met Arg Lys Thr Leu Ser
             20                  25                  30

Glu Lys Asn Met Leu Asn Asn Phe Leu Lys Glu Gln Ala Tyr Arg Leu
         35                  40                  45

Ser Gln Ile Ser Ser Arg Gly Ser Asn Ile Thr Ile His Pro Leu Arg
     50                  55                  60

Asn Ile Met Asp Met Val Tyr Val Gly Lys Ile Thr Ile Gly Thr Pro
 65                  70                  75                  80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Glu Leu Trp
                 85                  90                  95

Val Pro Ser Val Phe Cys Pro Ser Ser Ala Cys Ser Thr His Ile Arg
            100                 105                 110

Phe Arg His Leu Glu Ser Ser Thr Ser Gly Leu Thr Gln Lys Thr Phe
        115                 120                 125

Ser Ile Thr Tyr Gly Ser Gly Ser Thr Lys Gly Phe Leu Ala Tyr Asp
    130                 135                 140

Thr Val Arg Ile Gly Asp Leu Leu Ser Thr Asp Gln Glu Phe Gly Leu
145                 150                 155                 160

Ser Met Glu Glu His Gly Phe Glu Asp Leu Pro Phe Asp Gly Val Leu
                165                 170                 175

Gly Leu Asn Tyr Pro Asp Met Ser Phe Ile Thr Thr Ile Pro Ile Phe
            180                 185                 190

Asp Asn Leu Lys Asn Gln Gly Ala Phe Ser Glu Pro Val Phe Ala Phe
        195                 200                 205

Tyr Leu Gly Lys Val Lys Gly Ser Val Val Met Phe Gly Gly Val Asp
    210                 215                 220

His Thr Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile Gln Ala
225                 230                 235                 240

Gly Glu Trp Ser Leu His Met Asp Arg Ile Ser Met Lys Arg Lys Val
                245                 250                 255
```

Ile Ala Cys Ser Gly Gly Cys Glu Ala Phe Tyr Asp Thr Gly Thr Ser
260 265 270

Leu Ile Leu Gly Pro Arg Arg Leu Val Asn Asn Ile Gln Lys Leu Ile
275 280 285

Gly Ala Thr Pro Gln Gly Ser Glu His Tyr Ile Ser Cys Phe Ala Val
290 295 300

Ile Ser Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Ile Asn Ile Pro
305 310 315 320

Val Pro Ala Arg Ala Tyr Ile His Lys Asp Ser Arg Gly His Cys Tyr
325 330 335

Pro Thr Phe Lys Glu Asn Thr Val Ser Thr Ser Thr Glu Thr Trp Ile
340 345 350

Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp Arg Gly
355 360 365

Asn Asp Arg Ile Gly Leu Ala Gln Val
370 375

<210> 29
<211> 379
<212> PRT
<213> bovidae

<400> 29
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Asn Ala Ile Ser
20 25 30

Gly Lys Asn Thr Leu Asn Asn Ile Leu Lys Glu His Ala Tyr Arg Leu
35 40 45

Pro Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr His Pro Leu Arg Asn
50 55 60

Ile Arg Asp Leu Phe Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro Pro
65 70 75 80

Gln Glu Phe Gln Val Ile Phe Asp Thr Gly Ser Ser Asp Leu Trp Val

85 90 95

Ala Ser Ile Phe Cys Asn Ser Ser Ser Cys Ala Ala His Val Arg Phe
100 105 110

Arg His His Gln Ser Ser Thr Phe Arg Pro Thr Asn Lys Thr Phe Arg
115 120 125

Ile Thr Tyr Gly Ser Gly Arg Met Lys Gly Val Val Val His Asp Thr
130 135 140

Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu Cys
145 150 155 160

Leu Lys Asp Ser Gly Phe Lys Gly Ile Pro Phe Asp Gly Ile Leu Gly
165 170 175

Leu Ser Tyr Pro Asn Lys Thr Phe Ser Gly Ala Phe Pro Ile Phe Asp
180 185 190

Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Phe Ala Phe Tyr
195 200 205

Leu Ser Lys Asp Lys Gln Glu Gly Ser Val Val Met Phe Gly Gly Val
210 215 220

Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile Gln
225 230 235 240

Val Gly Asp Trp Phe Val His Met Asp Arg Thr Thr Met Lys Arg Lys
245 250 255

Val Ile Ala Cys Ser Asp Gly Cys Lys Ala Leu Val Asp Thr Gly Thr
260 265 270

Ser Asp Ile Val Gly Pro Ser Thr Leu Val Asn Asn Ile Trp Lys Leu
275 280 285

Ile Arg Ala Arg Pro Leu Gly Pro Gln Tyr Phe Val Ser Cys Ser Ala
290 295 300

Val Asn Thr Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Ile Asn Tyr
305 310 315 320

Arg Leu Pro Ala Arg Ala Tyr Ile His Lys Asp Ser Arg Gly Arg Cys
325 330 335

Tyr Thr Ala Phe Lys Glu His Arg Phe Ser Ser Pro Ile Glu Thr Trp

340 345 350

Leu Leu Gly Asp Val Phe Leu Arg Arg Tyr Phe Ser Val Phe Asp Arg
355 360 365

Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375

<210> 30
<211> 341
<212> PRT
<213> bovidae

<400> 30
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu Asp Pro Tyr Arg Leu
35 40 45

Ser His Ile Ser Phe Arg Gly Ser Asn Leu Thr Ile His Pro Leu Arg
50 55 60

Asn Ile Arg Asp Ile Phe Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Ile Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Ile Asp Cys Asn Ser Thr Ser Cys Ala Thr His Val Arg
100 105 110

Phe Arg His Leu Gln Ser Ser Thr Phe Arg Pro Thr Asn Lys Thr Phe
115 120 125

Arg Ile Ile Tyr Gly Ser Gly Arg Met Asn Gly Val Ile Ala Tyr Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145 150 155 160

Ser Val Glu Glu Tyr Gly Phe Ala His Lys Arg Phe Asp Gly Ile Leu
165 170 175

Gly Leu Asn Tyr Trp Asn Leu Ser Trp Ser Lys Ala Met Pro Ile Phe
180 185 190

Asp Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
195 200 205

Tyr Leu Ser Asn Ile Thr Met Asn Arg Glu Val Ile Ala Cys Ser Glu
210 215 220

Gly Cys Ala Ala Leu Val Asp Thr Gly Ser Ser Asn Ile Gln Gly Pro
225 230 235 240

Gly Arg Leu Ile Asp Asn Ile Gln Arg Ile Ile Gly Ala Thr Pro Arg
245 250 255

Gly Ser Lys Tyr Tyr Val Ser Cys Ser Ala Val Asn Ile Leu Pro Ser
260 265 270

Ile Ile Phe Thr Ile Asn Gly Val Asn Tyr Pro Val Pro Pro Arg Ala
275 280 285

Tyr Ile Leu Lys Asp Ser Arg Gly His Cys Tyr Thr Thr Phe Lys Glu
290 295 300

Lys Arg Val Arg Arg Ser Thr Glu Ser Trp Val Leu Gly Glu Val Phe
305 310 315 320

Leu Arg Leu Tyr Phe Ser Val Phe Asp Arg Gly Asn Asp Arg Ile Gly
325 330 335

Leu Ala Arg Arg Val
340

<210> 31
<211> 387
<212> PRT
<213> bovidae

<400> 31
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Leu Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Thr Lys Met Lys Thr Met Gln Glu Ala Ile Arg
20 25 30

Glu Lys Gln Leu Leu Glu Asp Phe Leu Asp Glu Gln Pro His Ser Leu
35 40 45

Ser Gln His Ser Asp Pro Asp Lys Lys Phe Ser Ser His Gln Leu Lys
50 55 60

Asn Phe Gln Asn Ala Val Tyr Phe Gly Thr Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Asn Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Val Asp Cys Gln Ser Pro Ser Cys Ser Lys His Lys Arg
100 105 110

Phe Asp Pro Gln Lys Ser Thr Thr Phe Gln Pro Leu Asn Gln Lys Ile
115 120 125

Glu Leu Val Tyr Gly Ser Gly Thr Met Lys Gly Val Leu Gly Ser Asp
130 135 140

Thr Ile Gln Ile Gly Asn Leu Val Ile Val Asn Gln Ile Phe Gly Leu
145 150 155 160

Ser Gln Asn Gln Ser Ser Gly Val Leu Glu Gln Val Pro Tyr Asp Gly
165 170 175

Ile Leu Gly Leu Ala Tyr Pro Ser Leu Ala Ile Gln Gly Thr Thr Pro
180 185 190

Val Phe Asp Asn Leu Lys Asn Arg Glu Val Ile Ser Glu Pro Val Phe
195 200 205

Ala Phe Tyr Leu Ser Ser Arg Pro Glu Asn Ile Ser Thr Val Met Phe
210 215 220

Gly Gly Val Asp His Thr Tyr His Lys Gly Lys Leu Gln Trp Ile Pro
225 230 235 240

Val Thr Gln Ala Arg Phe Trp Gln Val Ala Met Ser Ser Met Thr Met
245 250 255

Asn Gly Asn Val Val Gly Cys Ser Gln Gly Cys Gln Ala Val Val Asp
260 265 270

Thr Gly Thr Ser Leu Leu Val Gly Pro Thr His Leu Val Thr Asp Ile
275 280 285

Leu Lys Leu Ile Asn Pro Asn Pro Ile Leu Asn Asp Glu Gln Met Leu
290 295 300

```
Ser Cys Asp Ala Ile Asn Ser Leu Pro Thr Leu Leu Leu Thr Ile Asn
305                 310                 315                 320

Gly Ile Val Tyr Pro Val Pro Pro Asp Tyr Tyr Ile Gln Arg Phe Ser
                325                 330                 335

Glu Arg Ile Cys Phe Ile Ser Phe Gln Gly Gly Thr Glu Ile Leu Lys
            340                 345                 350

Asn Leu Gly Thr Ser Glu Thr Trp Ile Leu Gly Asp Val Phe Leu Arg
        355                 360                 365

Leu Tyr Phe Ser Val Tyr Asp Arg Gly Asn Asn Arg Ile Gly Leu Ala
    370                 375                 380

Pro Ala Ala
385
```


<210> 32
<211> 379
<212> PRT
<213> bovidae

<400> 32

```
Met Lys Trp Ile Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
  1               5                  10                  15

Val Lys Ile Pro Leu Arg Gln Val Lys Thr Met Arg Lys Thr Leu Ser
             20                  25                  30

Gly Lys Asn Met Leu Lys Asn Phe Leu Lys Glu His Pro Tyr Arg Leu
         35                  40                  45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Ile His Pro Leu Arg
     50                  55                  60

Asn Ile Met Asn Leu Val Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
 65                  70                  75                  80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Asp Leu Trp
                85                  90                  95

Val Pro Ser Phe Cys Thr Met Pro Ala Cys Ser Ala Pro Val Trp Phe
            100                 105                 110

Arg Gln Leu Gln Ser Ser Thr Phe Gln Pro Thr Asn Lys Thr Phe Thr
```

```
        115                 120                 125

Ile Thr Tyr Gly Ser Gly Ser Met Lys Gly Phe Leu Ala Tyr Asp Thr
    130                 135                 140

Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu Ser
145                 150                 155                 160

Val Val Glu Tyr Gly Leu Glu Gly Arg Asn Tyr Asp Gly Val Leu Gly
                165                 170                 175

Leu Asn Tyr Pro Asn Ile Ser Phe Ser Gly Ala Ile Pro Ile Phe Asp
            180                 185                 190

Asn Leu Lys Asn Gln Gly Ala Ile Ser Glu Pro Val Phe Ala Phe Tyr
        195                 200                 205

Leu Ser Lys Asn Lys Gln Glu Gly Ser Val Val Met Phe Gly Gly Val
    210                 215                 220

Asp His Gln Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Leu Ile Glu
225                 230                 235                 240

Ala Gly Glu Trp Arg Val His Met Asp Arg Ile Ser Met Lys Arg Thr
                245                 250                 255

Val Ile Ala Cys Ser Asp Gly Cys Glu Ala Leu Val His Thr Gly Thr
            260                 265                 270

Ser His Ile Glu Gly Pro Gly Arg Leu Val Asn Asn Ile His Arg Leu
        275                 280                 285

Ile Arg Thr Arg Pro Phe Asp Ser Lys His Tyr Val Ser Cys Phe Ala
    290                 295                 300

Thr Lys Tyr Leu Pro Ser Ile Thr Phe Ile Ile Asn Gly Ile Lys Tyr
305                 310                 315                 320

Pro Met Thr Ala Arg Ala Tyr Ile Phe Lys Asp Ser Arg Gly Arg Cys
                325                 330                 335

Tyr Ser Ala Phe Lys Glu Asn Thr Val Arg Thr Ser Arg Glu Thr Trp
            340                 345                 350

Ile Leu Gly Asp Ala Phe Leu Arg Arg Tyr Phe Ser Val Phe Asp Arg
        355                 360                 365

Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
```

370 375

<210> 33
<211> 380
<212> PRT
<213> bovidae

<400> 33

```
Met Lys Trp Leu Gly Leu Leu Gly Leu Val Ala Leu Ser Glu Cys Met
  1               5                  10                  15

Val Ile Ile Pro Leu Arg Gln Met Lys Thr Met Arg Glu Thr Leu Arg
             20                  25                  30

Glu Arg His Leu Leu Thr Asn Phe Ser Glu Glu His Pro Tyr Asn Leu
         35                  40                  45

Ser Gln Lys Ala Ala Asn Asp Gln Asn Ile Ile Tyr His His Pro Leu
     50                  55                  60

Arg Ser Tyr Lys Asp Phe Ser Tyr Ile Gly Asn Ile Asn Ile Gly Thr
 65                  70                  75                  80

Pro Pro Gln Glu Phe Gln Val Leu Phe Asp Thr Gly Ser Ser Ser Leu
                 85                  90                  95

Trp Val Pro Ser Ile Tyr Cys Gln Ser Ser Ser Cys Tyr Lys His Asn
            100                 105                 110

Ser Phe Val Pro Cys Asn Ser Ser Thr Phe Lys Ala Thr Asn Lys Ile
        115                 120                 125

Phe Asn Thr Asn Tyr Thr Ala Thr Ser Ile Lys Gly Tyr Leu Val Tyr
    130                 135                 140

Asp Thr Val Arg Ile Gly Asn Leu Val Ser Val Ala Gln Pro Phe Gly
145                 150                 155                 160

Leu Ser Leu Lys Glu Phe Gly Phe Asp Asp Val Pro Phe Asp Gly Ile
                165                 170                 175

Leu Gly Leu Gly Tyr Pro Arg Arg Thr Ile Thr Gly Ala Asn Pro Ile
            180                 185                 190

Phe Asp Asn Leu Trp Lys Gln Gly Val Ile Ser Glu Pro Val Phe Ala
        195                 200                 205
```

```
Phe Tyr Leu Ser Ser Gln Lys Glu Asn Gly Ser Val Val Met Phe Gly
    210                 215                 220

Gly Val Asn Arg Ala Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Val
225                 230                 235                 240

Ser Gln Val Gly Ser Trp His Ile Asn Ile Asp Ser Ile Ser Met Asn
                245                 250                 255

Gly Thr Val Val Ala Cys Lys Arg Gly Cys Gln Ala Ser Trp Ile Arg
            260                 265                 270

Gly Arg Leu Ser Ala Trp Pro Lys Arg Ile Val Ser Lys Ile Gln Lys
        275                 280                 285

Leu Ile His Ala Arg Pro Ile Asp Arg Glu His Val Val Ser Cys Gln
    290                 295                 300

Ala Ile Gly Thr Leu Pro Pro Ala Val Phe Thr Ile Asn Gly Ile Asp
305                 310                 315                 320

Tyr Pro Val Pro Ala Gln Ala Tyr Ile Gln Ser Leu Ser Gly Tyr Cys
                325                 330                 335

Phe Ser Asn Phe Leu Val Arg Pro Gln Arg Val Asn Glu Ser Glu Thr
            340                 345                 350

Trp Ile Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
        355                 360                 365

Arg Gly Asn Asn Arg Ile Gly Leu Ala Pro Ala Val
    370                 375                 380
```

<210> 34
<211> 376
<212> PRT
<213> bovidae

<400> 34

```
Met Lys Trp Leu Val Phe Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
  1               5                  10                  15

Val Ile Met Leu Leu Thr Lys Thr Lys Thr Met Arg Glu Ile Trp Arg
             20                  25                  30

Glu Lys Lys Leu Leu Asn Ser Phe Leu Glu Glu Gln Ala Asn Arg Met
         35                  40                  45
```

Ser Asp Asp Ser Ala Ser Asp Pro Lys Leu Ser Thr His Pro Leu Arg
50 55 60

Asn Ala Leu Asp Met Ala Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Lys Glu Phe Arg Val Val Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Ile Lys Cys Ile Ser Pro Ala Cys His Thr His Ile Thr
100 105 110

Phe Asp His His Lys Ser Ser Thr Phe Arg Leu Thr Arg Arg Pro Phe
115 120 125

His Ile Leu Tyr Gly Ser Gly Met Met Asn Gly Val Leu Ala Tyr Asp
130 135 140

Thr Val Arg Ile Gly Lys Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145 150 155 160

Ser Leu Gln Gln Phe Gly Phe Asp Asn Ala Pro Phe Asp Gly Val Leu
165 170 175

Gly Leu Ser Tyr Pro Ser Leu Ala Val Pro Gly Thr Ile Pro Ile Phe
180 185 190

Asp Lys Leu Lys Gln Gln Gly Ala Ile Ser Glu Pro Ile Phe Ala Phe
195 200 205

Tyr Leu Ser Thr Arg Lys Glu Asn Gly Ser Val Leu Met Leu Gly Gly
210 215 220

Val Asp His Ser Tyr His Lys Gly Lys Leu Asn Trp Ile Pro Val Ser
225 230 235 240

Gln Thr Lys Ser Trp Leu Ile Thr Val Asp Arg Ile Ser Met Asn Gly
245 250 255

Arg Val Ile Gly Cys Glu His Gly Cys Glu Ala Leu Val Asp Thr Gly
260 265 270

Thr Ser Leu Ile His Gly Pro Ala Arg Pro Val Thr Asn Ile Gln Lys
275 280 285

Phe Ile His Ala Met Pro Tyr Gly Ser Glu Tyr Met Val Leu Cys Pro
290 295 300

```
Val Ile Ser Ile Leu Pro Pro Val Ile Phe Thr Ile Asn Gly Ile Asp
305                 310                 315                 320

Tyr Ser Val Pro Arg Glu Ala Tyr Ile Gln Lys Ile Ser Asn Ser Leu
                325                 330                 335

Cys Leu Ser Thr Phe His Gly Asp Asp Thr Asp Gln Trp Ile Leu Gly
            340                 345                 350

Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Tyr Asp Arg Gly Asn Asn
        355                 360                 365

Arg Ile Gly Leu Ala Pro Ala Val
    370                 375
```

<210> 35
<211> 375
<212> PRT
<213> bovidae

<400> 35

```
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Leu Ser Glu Cys Ile
  1               5                  10                  15

Val Ile Leu Pro Leu Arg Lys Met Lys Thr Leu Arg Glu Thr Leu Arg
            20                  25                  30

Glu Lys Asn Leu Leu Asn Asn Phe Leu Glu Glu Arg Ala Tyr Arg Leu
        35                  40                  45

Ser Lys Lys Asp Ser Lys Ile Thr Ile His Pro Leu Lys Asn Tyr Leu
    50                  55                  60

Asp Met Ala Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro Pro Gln Glu
65                  70                  75                  80

Phe Arg Val Val Phe Asp Thr Gly Ser Ala Asp Leu Trp Val Pro Ser
                85                  90                  95

Ile Ser Cys Val Ser Pro Ala Cys Tyr Thr His Lys Thr Phe Asn Leu
            100                 105                 110

His Asn Ser Ser Ser Phe Gly Gln Thr His Gln Pro Ile Ser Ile Ser
        115                 120                 125

Tyr Gly Pro Gly Ile Ile Gln Gly Phe Leu Gly Ser Asp Thr Val Arg
```

130 135 140

Ile Gly Asn Leu Val Ser Leu Lys Gln Ser Phe Gly Leu Ser Gln Glu
145 150 155 160

Glu Tyr Gly Phe Asp Gly Ala Pro Phe Asp Gly Val Leu Gly Leu Ala
165 170 175

Tyr Pro Ser Ile Ser Ile Lys Gly Ile Ile Pro Ile Phe Asp Asn Leu
180 185 190

Trp Ser Gln Gly Ala Phe Ser Glu Pro Val Phe Ala Phe Tyr Leu Asn
195 200 205

Thr Cys Gln Pro Glu Gly Ser Val Val Met Phe Gly Gly Val Asp His
210 215 220

Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Val Ser Gln Thr Arg
225 230 235 240

Tyr Trp Gln Ile Ser Met Asn Arg Ile Ser Met Asn Gly Asn Val Thr
245 250 255

Ala Cys Ser Arg Gly Cys Gln Ala Leu Leu Asp Thr Gly Thr Ser Met
260 265 270

Ile His Gly Pro Thr Arg Leu Ile Thr Asn Ile His Lys Leu Met Asn
275 280 285

Ala Arg His Gln Gly Ser Glu Tyr Val Val Ser Cys Asp Ala Val Lys
290 295 300

Thr Leu Pro Pro Val Ile Phe Asn Ile Asn Gly Ile Asp Tyr Pro Leu
305 310 315 320

Pro Pro Gln Ala Tyr Ile Thr Lys Ala Gln Asn Phe Cys Leu Ser Ile
325 330 335

Phe His Gly Gly Thr Glu Thr Ser Ser Pro Glu Thr Trp Ile Leu Gly
340 345 350

Gly Val Phe Leu Arg Gln Tyr Phe Ser Val Phe Asp Arg Arg Asn Asp
355 360 365

Ser Ile Gly Leu Ala Gln Val
370 375

<210> 36
<211> 391
<212> PRT
<213> bovidae

<400> 36

```
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Leu Ser Glu Cys Ile
  1               5                  10                  15

Val Ile Leu Pro Leu Lys Lys Met Lys Thr Leu Arg Glu Thr Leu Arg
             20                  25                  30

Glu Lys Asn Leu Leu Asn Asn Phe Leu Glu Glu Gln Ala Tyr Arg Leu
         35                  40                  45

Ser Lys Asn Asp Ser Lys Ile Thr Ile His Pro Leu Arg Asn Tyr Leu
     50                  55                  60

Asp Thr Ala Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro Pro Gln Glu
 65                  70                  75                  80

Phe Arg Val Val Phe Asp Thr Gly Ser Ala Asn Leu Trp Val Pro Cys
                 85                  90                  95

Ile Thr Cys Thr Ser Pro Ala Cys Tyr Thr His Lys Thr Phe Asn Pro
            100                 105                 110

Gln Asn Ser Ser Ser Phe Arg Glu Val Gly Ser Pro Ile Thr Ile Phe
        115                 120                 125

Tyr Gly Ser Gly Ile Ile Gln Gly Phe Leu Gly Ser Asp Thr Val Arg
    130                 135                 140

Ile Gly Asn Leu Val Ser Leu Lys Gln Ser Phe Gly Leu Ser Gln Glu
145                 150                 155                 160

Glu Tyr Gly Phe Asp Gly Ala Pro Phe Asp Gly Val Leu Gly Leu Ala
                165                 170                 175

Tyr Pro Ser Ile Ser Ile Lys Gly Ile Ile Pro Ile Phe Asp Asn Leu
            180                 185                 190

Trp Ser His Gly Ala Phe Ser Glu Pro Val Phe Ala Phe Tyr Leu Asn
        195                 200                 205

Thr Asn Lys Pro Glu Gly Ser Val Val Met Phe Gly Gly Val Asp His
    210                 215                 220
```

Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Val Ser Gln Thr Ser
225 230 235 240

His Trp Gln Ile Ser Met Asn Asn Ile Ser Met Asn Gly Thr Val Thr
245 250 255

Ala Cys Ser Cys Gly Cys Glu Ala Leu Leu Asp Thr Gly Thr Ser Met
260 265 270

Ile Tyr Gly Pro Thr Lys Leu Val Thr Asn Ile His Lys Leu Met Asn
275 280 285

Ala Arg Leu Glu Asn Ser Glu Tyr Val Val Ser Cys Asp Ala Val Lys
290 295 300

Thr Leu Pro Pro Val Ile Phe Asn Ile Asn Gly Ile Asp Tyr Pro Leu
305 310 315 320

Arg Pro Gln Ala Tyr Ile Ile Lys Ile Gln Asn Asn Cys Arg Ser Val
325 330 335

Phe Gln Gly Gly Thr Glu Asn Ser Ser Leu Asn Thr Trp Ile Leu Gly
340 345 350

Asp Ile Phe Leu Arg Gln Tyr Phe Ser Val Phe Asp Arg Lys Asn Arg
355 360 365

Arg Ile Cys Trp His Arg Trp Val Pro Thr Thr Arg Thr Thr Met Thr
370 375 380

Ser Lys Leu Pro Pro Lys Leu
385 390

<210> 37
<211> 392
<212> PRT
<213> bovidae

<400> 37
Met Lys Trp Leu Val Leu Leu Ala Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Ile Lys Ile Pro Leu Arg Arg Val Lys Thr Met Ser Asn Thr Ala Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Lys His Pro Tyr Arg Leu
35 40 45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Thr His Pro Leu Met
50 55 60

Asn Ile Trp Asp Leu Leu Tyr Leu Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Leu Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Leu Leu Cys Asn Ser Ser Thr Cys Ala Lys His Val Met
100 105 110

Phe Arg His Arg Leu Ser Ser Thr Tyr Arg Pro Thr Asn Lys Thr Phe
115 120 125

Met Ile Phe Tyr Ala Val Gly Lys Ile Glu Gly Val Val Val Arg Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Ala Asp Gln Thr Phe Gly Leu
145 150 155 160

Ser Ile Ala Glu Thr Gly Phe Glu Asn Thr Thr Leu Asp Gly Ile Leu
165 170 175

Gly Leu Ser Tyr Pro Asn Thr Ser Cys Phe Gly Thr Ile Pro Ile Phe
180 185 190

Asp Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Leu His Ser
195 200 205

Val Arg Arg Lys Asp Glu Gln Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Ser Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile
225 230 235 240

Lys Ala Gly Asp Trp Ser Val Arg Val Asp Ser Ile Thr Met Lys Arg
245 250 255

Glu Val Ile Ala Cys Ser Asp Gly Cys Arg Ala Leu Val Asp Thr Gly
260 265 270

Ser Ser His Ile Gln Gly Pro Gly Arg Leu Ile Asp Asn Val Gln Lys
275 280 285

Leu Ile Gly Thr Met Pro Gln Gly Ser Met His Tyr Val Pro Cys Ser
290 295 300

```
Ala Val Asn Thr Leu Pro Ser Ile Ile Phe Thr Ile Asn Ser Ile Ser
305                 310                 315                 320

Tyr Thr Val Pro Ala Gln Ala Tyr Ile Leu Lys Gly Ser Arg Gly Arg
                325                 330                 335

Cys Tyr Ser Thr Phe Gln Gly His Thr Met Ser Ser Ser Thr Glu Thr
            340                 345                 350

Trp Ile Leu Gly Asp Val Phe Leu Ser Gln Tyr Phe Ser Val Phe Asp
        355                 360                 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Gln Val Gly Thr Asp Tyr Lys
    370                 375                 380

Asp Asp Asp Glu Ser Pro Lys Leu
385                 390


<210> 38
<211> 388
<212> PRT
<213> Felis domestica

<400> 38
Met Lys Trp Leu Trp Val Leu Gly Leu Val Ala Leu Ser Glu Cys Leu
  1               5                  10                  15

Val Thr Ile Pro Leu Thr Arg Val Lys Ser Met Arg Glu Asn Leu Arg
             20                  25                  30

Glu Lys Asp Arg Leu Lys Asp Phe Leu Glu Asn His Pro Tyr Asn Leu
         35                  40                  45

Ala Tyr Lys Phe Val Asp Ser Val Asn Leu Asp Leu Gly Ile Tyr Phe
     50                  55                  60

Glu Pro Met Arg Asn Tyr Leu Asp Leu Ala Tyr Val Gly Thr Ile Ser
 65                  70                  75                  80

Ile Gly Thr Pro Pro Gln Glu Phe Lys Val Ile Phe Asp Thr Gly Ser
                85                  90                  95

Ser Asp Leu Trp Val Pro Ser Ile Tyr Cys Ser Ser Pro Ala Cys Ala
            100                 105                 110

Asn His Asn Val Phe Asn Pro Leu Arg Ser Ser Thr Phe Arg Ile Ser
```

```
        115                 120                 125

Gly Arg Pro Ile His Leu Gln Tyr Gly Ser Gly Thr Met Ser Gly Phe
    130                 135                 140

Leu Ala Tyr Asp Thr Val Arg Phe Gly Gly Leu Val Asp Val Ala Gln
145                 150                 155                 160

Ala Phe Gly Leu Ser Leu Arg Glu Pro Gly Lys Phe Met Glu Tyr Ala
                165                 170                 175

Val Phe Asp Gly Ile Leu Gly Leu Ala Tyr Pro Ser Leu Ser Leu Arg
            180                 185                 190

Gly Thr Val Pro Val Phe Asp Asn Leu Trp Lys Gln Gly Leu Ile Ser
        195                 200                 205

Gln Glu Leu Phe Ala Phe Tyr Leu Ser Lys Lys Asp Glu Glu Gly Ser
    210                 215                 220

Val Val Met Phe Gly Gly Val Asp His Ser Tyr Tyr Ser Gly Asp Leu
225                 230                 235                 240

Asn Trp Val Pro Val Ser Lys Arg Leu Tyr Trp Gln Leu Ser Met Asp
                245                 250                 255

Ser Ile Ser Met Asn Gly Glu Val Ile Ala Cys Asp Gly Gly Cys Gln
            260                 265                 270

Ala Ile Ile Asp Thr Gly Thr Ser Leu Leu Ile Gly Pro Ser His Val
        275                 280                 285

Val Phe Asn Ile Gln Met Ile Ile Gly Ala Asn Gln Ser Tyr Ser Gly
    290                 295                 300

Glu Tyr Val Val Asp Cys Asp Ala Ala Asn Thr Leu Pro Asp Ile Val
305                 310                 315                 320

Phe Thr Ile Asn Gly Ile Asp Tyr Pro Val Pro Ala Ser Ala Tyr Ile
                325                 330                 335

Gln Glu Gly Pro Gln Gly Thr Cys Tyr Ser Gly Phe Asp Glu Ser Gly
            340                 345                 350

Asp Ser Leu Leu Val Ser Asp Ser Trp Ile Leu Gly Asp Val Phe Leu
        355                 360                 365

Arg Leu Tyr Phe Thr Val Phe Asp Arg Glu Asn Asn Arg Ile Gly Leu
```

370 375 380

Ala Leu Ala Val
385

<210> 39
<211> 1158
<212> DNA
<213> bovidae

<400> 39
aggaaagaag catgaagtgg cttgtggtcc tcgggctggt ggccttctca gagtgcatag 60
tcaaaatacc tctaaggaga gtgaagacca tgagaaaaac tctcagtgga aaaaacatgc 120
tgaacaattt cttgaaggag gatccttaca gactgtccca gatttctttt cgtggctcaa 180
atctaactat tcacccgctg agaaacatca gagatatctt ctatgtcgga aacatcacca 240
ttggaacacc ccctcaggaa ttccaggtta tctttgacac aggctcatct gacttgtggg 300
tgccctcgat cgattgcaac agtacatcct gtgctacaca tgttaggttc agacatcttc 360
agtcttccac cttccggcct accaataaga ccttcaggat catctatgga tctgggagaa 420
tgaacggagt tattgcttat gacacagttc ggattgggga ccttgtaagt accgaccagc 480
catttggtct aagcgtggag gaatatgggt ttgcgcacaa aagatttgat ggcatcttgg 540
gcttgaacta ctggaaccta tcctggtcta aggccatgcc catctttgac aagctgaaga 600
atgaaggcgc catttctgag cctgtttttg ccttctactt gagcaaagac aagcgggagg 660
gcagtgtggt gatgtttggt ggggtggacc accgctacta caagggagag ctcaagtggg 720
taccactgat ccaagcagtc gactggagtg tacacgtaga ccgcatcacc atgaacagag 780
aggttattgc ttgttctgaa ggctgtgcgg cccttgtgga cactgggtca tcaaatatcc 840
aaggcccaag aagactgatt gataacatac agaggatcat cggcgccacg ccacggggtt 900
ccaagtacta cgtttcatgt tctgcggtca atatcctgcc ctctattatc ttcaccatca 960
acggcgtcaa ctacccagtg ccacctcgag cttacatcct caaggattct agaggccact 1020
gctataccac ctttaaagag aaaagagtga ggagatctac agagagctgg gtcctgggtg 1080
aagtcttcct gaggctgtat ttctcagtct ttgatcgagg aaatgacagg attggcctgg 1140
cacgggcagt gtaactcg 1158

<210> 40
<211> 380
<212> PRT
<213> bovidae

<400> 40
Met Lys Trp Leu Val Val Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu Asp Pro Tyr Arg Leu
35 40 45

```
Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Ile His Pro Leu Arg
     50                  55                  60

Asn Ile Arg Asp Ile Phe Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
 65                  70                  75                  80

Pro Gln Glu Phe Gln Val Ile Phe Asp Thr Gly Ser Ser Asp Leu Trp
                 85                  90                  95

Val Pro Ser Ile Asp Cys Asn Ser Thr Ser Cys Ala Thr His Val Arg
            100                 105                 110

Phe Arg His Leu Gln Ser Ser Thr Phe Arg Pro Thr Asn Lys Thr Phe
        115                 120                 125

Arg Ile Ile Tyr Gly Ser Gly Arg Met Asn Gly Val Ile Ala Tyr Asp
    130                 135                 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145                 150                 155                 160

Ser Val Glu Glu Tyr Gly Phe Ala His Lys Arg Phe Asp Gly Ile Leu
                165                 170                 175

Gly Leu Asn Tyr Trp Asn Leu Ser Trp Ser Lys Ala Met Pro Ile Phe
            180                 185                 190

Asp Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
        195                 200                 205

Tyr Leu Ser Lys Asp Lys Arg Glu Gly Ser Val Val Met Phe Gly Gly
    210                 215                 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Lys Trp Val Pro Leu Ile
225                 230                 235                 240

Gln Ala Val Asp Trp Ser Val His Val Asp Arg Ile Thr Met Asn Arg
                245                 250                 255

Glu Val Ile Ala Cys Ser Glu Gly Cys Ala Ala Leu Val Asp Thr Gly
            260                 265                 270

Ser Ser Asn Ile Gln Gly Pro Arg Arg Leu Ile Asp Asn Ile Gln Arg
        275                 280                 285

Ile Ile Gly Ala Thr Pro Arg Gly Ser Lys Tyr Tyr Val Ser Cys Ser
    290                 295                 300
```

Ala Val Asn Ile Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Val Asn
305 310 315 320

Tyr Pro Val Pro Pro Arg Ala Tyr Ile Leu Lys Asp Ser Arg Gly His
325 330 335

Cys Tyr Thr Thr Phe Lys Glu Lys Arg Val Arg Arg Ser Thr Glu Ser
340 345 350

Trp Val Leu Gly Glu Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 41
<211> 1155
<212> DNA
<213> bovidae

<400> 41
aggaaagaag catgaagtgg attgtgctcc tcgggctgat ggccttctca gagtgcatag 60
tccaaatacc tctaaggcaa gtgaagacca tgagaaaaac cctcagtgga aaaaacatgc 120
tgaagaattt cttgaaggag catccttaca gactgtccca gatttctttt cgtggctcaa 180
atctaactat tcacccgctg aggaacatca tgaatttggt ctacgtgggt aacatcacca 240
ttggaacacc ccctcaggaa ttccaggttg tctttgacac aggctcatct gacttgtggg 300
tgccctcctt ttgtaccatg ccagcatgct ctgcaccggt ttggttcaga caacttcagt 360
cttccacctt ccagcctacc aataagacct tcaccatcac ctatggatct gggagcatga 420
agggatttct tgcttatgac acagttcgga ttggggacct tgtaagtact gatcagccgt 480
tcggtctaag cgtggtggaa tatgggttgg agggcagaaa ttatgatggt gccttgggct 540
tgaactaccc caacatatcc ttctctggag ccatccccat ctttgacaac ctgaagaatc 600
aaggtgccat ttctgagcct gtttttgcct tctacttgag caaaaacaag caggagggca 660
gtgtggtgat gtttggtggg gtggaccacc agtactacaa gggagagctc aactggatac 720
cactgattga agcaggcgaa tggagagtac acatggaccg catctccatg aaaagaacgg 780
ttattgcttg ttctgatggc tgtgaggccc ttgtgcacac tgggacatca catatcgaag 840
gcccaggaag actggtgaat aacatacaca ggctcatccg caccaggcca tttgattcca 900
agcactacgt ttcatgtttt gccaccaata ccctgccctc tattactttc atcatcaacg 960
gcatcaagta cccaatgaca gctcgagcct acatctttaa ggattctaga ggccgctgct 1020
attccgcttt taaagagaac acagtgagaa catctagaga gacctggatc ctcggtgatg 1080
ccttcctgag gcggtatttc tcagtctttg atcgaggaaa tgacaggatt ggcctggcac 1140
gggcagtgta actcg 1155

<210> 42
<211> 379
<212> PRT
<213> bovidae

<400> 42

```
Met Lys Trp Ile Val Leu Leu Gly Leu Met Ala Phe Ser Glu Cys Ile
 1               5                  10                  15

Val Gln Ile Pro Leu Arg Gln Val Lys Thr Met Arg Lys Thr Leu Ser
            20                  25                  30

Gly Lys Asn Met Leu Lys Asn Phe Leu Lys Glu His Pro Tyr Arg Leu
        35                  40                  45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Ile His Pro Leu Arg
    50                  55                  60

Asn Ile Met Asn Leu Val Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65                  70                  75                  80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Asp Leu Trp
                85                  90                  95

Val Pro Ser Phe Cys Thr Met Pro Ala Cys Ser Ala Pro Val Trp Phe
            100                 105                 110

Arg Gln Leu Gln Ser Ser Thr Phe Gln Pro Thr Asn Lys Thr Phe Thr
        115                 120                 125

Ile Thr Tyr Gly Ser Gly Ser Met Lys Gly Phe Leu Ala Tyr Asp Thr
    130                 135                 140

Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu Ser
145                 150                 155                 160

Val Val Glu Tyr Gly Leu Glu Gly Arg Asn Tyr Asp Gly Ala Leu Gly
                165                 170                 175

Leu Asn Tyr Pro Asn Ile Ser Phe Ser Gly Ala Ile Pro Ile Phe Asp
            180                 185                 190

Asn Leu Lys Asn Gln Gly Ala Ile Ser Glu Pro Val Phe Ala Phe Tyr
        195                 200                 205

Leu Ser Lys Asn Lys Gln Glu Gly Ser Val Val Met Phe Gly Gly Val
    210                 215                 220

Asp His Gln Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Leu Ile Glu
225                 230                 235                 240

Ala Gly Glu Trp Arg Val His Met Asp Arg Ile Ser Met Lys Arg Thr
                245                 250                 255
```

Val Ile Ala Cys Ser Asp Gly Cys Glu Ala Leu Val His Thr Gly Thr
260 265 270

Ser His Ile Glu Gly Pro Gly Arg Leu Val Asn Asn Ile His Arg Leu
275 280 285

Ile Arg Thr Arg Pro Phe Asp Ser Lys His Tyr Val Ser Cys Phe Ala
290 295 300

Thr Asn Thr Leu Pro Ser Ile Thr Phe Ile Ile Asn Gly Ile Lys Tyr
305 310 315 320

Pro Met Thr Ala Arg Ala Tyr Ile Phe Lys Asp Ser Arg Gly Arg Cys
325 330 335

Tyr Ser Ala Phe Lys Glu Asn Thr Val Arg Thr Ser Arg Glu Thr Trp
340 345 350

Ile Leu Gly Asp Ala Phe Leu Arg Arg Tyr Phe Ser Val Phe Asp Arg
355 360 365

Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375

<210> 43
<211> 1154
<212> DNA
<213> bovidae

<400> 43
aggaaagaag catgaagtgg cttgtgctcc tagggctggt ggccttctca gagtgcgtag 60
tcaaaatacc tctaaggaga gtgaagacca tgacaaaaac cctcagtggg aaaaacatgc 120
tgaacaattt cctgaaggag catgcttaca gactgtccca gatttctttt catggctcaa 180
atctaactat tcacccgctg agaaacatca gggatttgtt ctacatgggt aacatcacca 240
ttggaacacc ccctcaggaa ttcctggttg tctttgacac aggctcatct gacttgtggg 300
ttcctccga cttttgcacc agtccagcct gttctaaaca ctttaggttc agacatcttc 360
agtcttccac attccggctt accaataaga ccttcagcat tgaatacgga tctgggacaa 420
tggaaggaat tgttgctcat gacacagttc ggattgggga ccttgtaagc actgaccagc 480
cgtttggtct aagcatgaca gaatccgggt ttgagggtat acctttgat ggcgtcttgg 540
gcttgaacta ccccaacata tccttctctg gagccatccc catctttgac aagctgaaga 600
atcaaggtgc catttctgag cctgtttttg ccttctattt gagcaaagac gagcaggagg 660
gcagtgtggt gatgtttggt ggggtggacc accgctacta caagggagag ctcaaatggg 720
taccattgat tgaagcgggt gactggattg tacacatgga ctgcatctcc atgagaagaa 780
aggttattgc ttgttctggc ggctgtgagg ccgttgttga caccggggta tcaatgatca 840
aaggcccaaa aacactggtt gataacatcc agaagctcat cggtgccact ctacggggtt 900
tcaagcacta cgtttcatgt tctgcagtcg ataccctgcc ctctattacc ttcaccataa 960

acggtatcaa ctaccgagtg ccagctcgag cctacatcct caaggattct agaggctgct 1020
gctatagcag ctttcaagag accactgtga gtccatctac agagacctgg atcctgggtg 1080
acgtcttcct gagactgtat ttctcagtct ttgatcgagg aaatgacagg attgggctgg 1140
cacgggcagt gtaa 1154

<210> 44
<211> 380
<212> PRT
<213> bovidae

<400> 44

```
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Val
  1               5                  10                  15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Thr Lys Thr Leu Ser
             20                  25                  30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu His Ala Tyr Arg Leu
         35                  40                  45

Ser Gln Ile Ser Phe His Gly Ser Asn Leu Thr Ile His Pro Leu Arg
     50                  55                  60

Asn Ile Arg Asp Leu Phe Tyr Met Gly Asn Ile Thr Ile Gly Thr Pro
 65                  70                  75                  80

Pro Gln Glu Phe Leu Val Val Phe Asp Thr Gly Ser Ser Asp Leu Trp
                 85                  90                  95

Val Pro Ser Asp Phe Cys Thr Ser Pro Ala Cys Ser Lys His Phe Arg
            100                 105                 110

Phe Arg His Leu Gln Ser Ser Thr Phe Arg Leu Thr Asn Lys Thr Phe
        115                 120                 125

Ser Ile Glu Tyr Gly Ser Gly Thr Met Glu Gly Ile Val Ala His Asp
    130                 135                 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145                 150                 155                 160

Ser Met Thr Glu Ser Gly Phe Glu Gly Ile Pro Phe Asp Gly Val Leu
                165                 170                 175

Gly Leu Asn Tyr Pro Asn Ile Ser Phe Ser Gly Ala Ile Pro Ile Phe
            180                 185                 190

Asp Lys Leu Lys Asn Gln Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
```

195 200 205

Tyr Leu Ser Lys Asp Glu Gln Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Lys Trp Val Pro Leu Ile
225 230 235 240

Glu Ala Gly Asp Trp Ile Val His Met Asp Cys Ile Ser Met Arg Arg
245 250 255

Lys Val Ile Ala Cys Ser Gly Gly Cys Glu Ala Val Val Asp Thr Gly
260 265 270

Val Ser Met Ile Lys Gly Pro Lys Thr Leu Val Asp Asn Ile Gln Lys
275 280 285

Leu Ile Gly Ala Thr Leu Arg Gly Phe Lys His Tyr Val Ser Cys Ser
290 295 300

Ala Val Asp Thr Leu Pro Ser Ile Thr Phe Thr Ile Asn Gly Ile Asn
305 310 315 320

Tyr Arg Val Pro Ala Arg Ala Tyr Ile Leu Lys Asp Ser Arg Gly Cys
325 330 335

Cys Tyr Ser Ser Phe Gln Glu Thr Thr Val Ser Pro Ser Thr Glu Thr
340 345 350

Trp Ile Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 45
<211> 1168
<212> DNA
<213> bovidae

<400> 45
aggaaagaag catgaagtgg cttgtgctcc tcgggctggt ggccttctca gagtgcatag 60
tcaaaatacc tctaaggaga gtgaagacca tgagaaaaac cctcagtgga aaaaacacgc 120
tgaacaattt cttgaaggag catccttaca gactgtccca tatttctttt cgtggctcaa 180
atctaactac tctgccgctg agaaacatca gagatatgct ctacgtgggt aacatcacca 240
ttggaacacc ccctcaagaa ttccaggttg tctttgacac aggttcatct gacttgtggg 300
tgccctctga cttttgcacc agtccagcct gttctacaca cgttaggttc agacattttc 360

agtcttccac cttccggcct accactaaga ccttcaggat catctatgga tctgggagaa 420
tgaaaggagt tgttgcgcat gacacagttc ggattgggaa ccttgtaagt actgaccagc 480
cgttcggcct aagcatggcg gaatacgggt tggagagcag aagatttgat ggcatcttgg 540
gcttgaacta ccccaatcta tcctgctctg gggccattcc catctttgat aagctgaaga 600
atcaaggtgc catttctgat cctatttttg ccttctactt gagcaaagac aagcgagagg 660
gcagtgtggt gatgtttggt ggggtggacc accgctacta caagggagag ctcaactggg 720
taccactgat tcgagcaggt gactggattg tacacgtaga ccgcatcacc atgaaaagag 780
aggttattgc ttgttctgat ggctgcgcgg cccttgtgga cactgggaca tcacttatcc 840
aaggcccagg aagagtgatc gataacatac acaagctcat tggtgccacg ccacggggtt 900
ccaagcatta cgtttcatgt tctgtggtca atactctgcc ctctattatc ttcaccatca 960
atggcatcaa ctacccagtg ccagctccag cctacatcct caaggattct agaggctact 1020
gctataccgc ctttaaagag caaagagtga ggagatctac agagagctgg ttactgggtg 1080
acgtcttcct gaggctgtat ttctcagtct ttgatcgagg aaatgacagg attggcctgg 1140
cacgggcagt gtaactcgaa tcactagt 1168

<210> 46
<211> 380
<212> PRT
<213> bovidae

<400> 46
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Thr Leu Asn Asn Phe Leu Lys Glu His Pro Tyr Arg Leu
35 40 45

Ser His Ile Ser Phe Arg Gly Ser Asn Leu Thr Thr Leu Pro Leu Arg
50 55 60

Asn Ile Arg Asp Met Leu Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Asp Phe Cys Thr Ser Pro Ala Cys Ser Thr His Val Arg
100 105 110

Phe Arg His Phe Gln Ser Ser Thr Phe Arg Pro Thr Thr Lys Thr Phe
115 120 125

Arg Ile Ile Tyr Gly Ser Gly Arg Met Lys Gly Val Val Ala His Asp
130 135 140

Thr Val Arg Ile Gly Asn Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145 150 155 160

Ser Met Ala Glu Tyr Gly Leu Glu Ser Arg Arg Phe Asp Gly Ile Leu
165 170 175

Gly Leu Asn Tyr Pro Asn Leu Ser Cys Ser Gly Ala Ile Pro Ile Phe
180 185 190

Asp Lys Leu Lys Asn Gln Gly Ala Ile Ser Asp Pro Ile Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Asp Lys Arg Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile
225 230 235 240

Arg Ala Gly Asp Trp Ile Val His Val Asp Arg Ile Thr Met Lys Arg
245 250 255

Glu Val Ile Ala Cys Ser Asp Gly Cys Ala Ala Leu Val Asp Thr Gly
260 265 270

Thr Ser Leu Ile Gln Gly Pro Gly Arg Val Ile Asp Asn Ile His Lys
275 280 285

Leu Ile Gly Ala Thr Pro Arg Gly Ser Lys His Tyr Val Ser Cys Ser
290 295 300

Val Val Asn Thr Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Ile Asn
305 310 315 320

Tyr Pro Val Pro Ala Pro Ala Tyr Ile Leu Lys Asp Ser Arg Gly Tyr
325 330 335

Cys Tyr Thr Ala Phe Lys Glu Gln Arg Val Arg Arg Ser Thr Glu Ser
340 345 350

Trp Leu Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 47
<211> 1158

<212> DNA
<213> bovidae

<400> 47
aggaaagaag catgaagtgg cttgtgctcc tctggctagt ggccttctca gagtgtatag 60
tcaaaatacc tctaaggcaa gtgaagacca tgagaaaaac cctcagtgga aaaaacacgc 120
tgaacaattt cttgaaggaa catacttaca gtctgtccca gatttcttct cgtggttcaa 180
atctaactat tcacccactg agaaacatca tggatatgct ctacgtgggt aacatcacca 240
ttggaacacc ccctcaggaa ttccaggttg tctttgacac aggctcatct gacttgtggg 300
tgccctccgt cttttgccaa agtctagcct gtgctacaaa ggttatgttc atacatcttc 360
attcttccac cttccggcat acccaaaagg tcttcaacat caagtacaat actggaagga 420
tgaaaggact tcttgtttat gacactgttc ggattgggga ccttgtaagt actgaccagc 480
cattctgtat aagcctggca gaagttgggt ttgacggtat acctttgat ggtgtcttgg 540
gcttgaacta tccgaacatg tccttctctg gagccatccc catctttgac aacctgaaga 600
atgaaggtgc catttctgag cctgtttttg ccttctactt gagcaaagac aagcgggagg 660
gcagtgtggt gatgtttggt ggggtggacc accgctacta caagggagag ctcaactggg 720
tgccattgat ccaagcgggc ggctggactg tacacgtgga ccgcatctcc atgaaaagaa 780
agattattgc ttgttctgga ggctgcgagg cccttgtgga caccggaaca gcactgatca 840
aaggcccaag aagactggtc aataacatac agaagctcat cggcaccacg ccacggggtt 900
ccaagcacta cgtttcatgt tctgtggtca ataccctgcc ctctattatc ttcaccatca 960
acggcatcaa ctacccggtg ccagcacgag cctacatcct caaggattct gaaagcaact 1020
gctatacaac ctttaaagag aacacagtga ggacgtctag agagacctgg atcctgggtg 1080
acgtcttccc gaggctgtat ttctcagtct ttgatcgagg aaatgacagg attggcctgg 1140
cacgggcagt gtaactcg 1158

<210> 48
<211> 380
<212> PRT
<213> bovidae

<400> 48
Met Lys Trp Leu Val Leu Leu Trp Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Gln Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Thr Leu Asn Asn Phe Leu Lys Glu His Thr Tyr Ser Leu
35 40 45

Ser Gln Ile Ser Ser Arg Gly Ser Asn Leu Thr Ile His Pro Leu Arg
50 55 60

Asn Ile Met Asp Met Leu Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Val Phe Cys Gln Ser Leu Ala Cys Ala Thr Lys Val Met
100 105 110

Phe Ile His Leu His Ser Ser Thr Phe Arg His Thr Gln Lys Val Phe
115 120 125

Asn Ile Lys Tyr Asn Thr Gly Arg Met Lys Gly Leu Leu Val Tyr Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Cys Ile
145 150 155 160

Ser Leu Ala Glu Val Gly Phe Asp Gly Ile Pro Phe Asp Gly Val Leu
165 170 175

Gly Leu Asn Tyr Pro Asn Met Ser Phe Ser Gly Ala Ile Pro Ile Phe
180 185 190

Asp Asn Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Asp Lys Arg Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile
225 230 235 240

Gln Ala Gly Gly Trp Thr Val His Val Asp Arg Ile Ser Met Lys Arg
245 250 255

Lys Ile Ile Ala Cys Ser Gly Gly Cys Glu Ala Leu Val Asp Thr Gly
260 265 270

Thr Ala Leu Ile Lys Gly Pro Arg Arg Leu Val Asn Asn Ile Gln Lys
275 280 285

Leu Ile Gly Thr Thr Pro Arg Gly Ser Lys His Tyr Val Ser Cys Ser
290 295 300

Val Val Asn Thr Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Ile Asn
305 310 315 320

Tyr Pro Val Pro Ala Arg Ala Tyr Ile Leu Lys Asp Ser Glu Ser Asn
325 330 335

Cys Tyr Thr Thr Phe Lys Glu Asn Thr Val Arg Thr Ser Arg Glu Thr
340 345 350

Trp Ile Leu Gly Asp Val Phe Pro Arg Leu Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 49
<211> 1158
<212> DNA
<213> bovidae

<400> 49
taggaaagaa gcatgaagtg gcttgtgctc ctcgggctgg tggccttctc agagtgcata 60
gtcaaaatac ctctaaggag agtgaagacc atgagaaaaa ccctcagtgg aaaaaacatc 120
ctgaacaatt tcctgaagga acatgcttac agactgtccc agatttcttc ttgtggctca 180
aatctaactt ttcacccctt gagaaacatc aaggataggc tctacgtggg taacatcacc 240
attggaacac cccctcaaga attccaggtt atctttgaca caggctcatc tgacttgtgg 300
gtgacctccg tcttttgcac cagcccaacc tgttctacac atgttatgtt cagacatttt 360
gattcttcca ccttccggcc taccaaaaag accttcagca tcaactacgg ttctggaagg 420
atgaaaggag ttgttgttca tgacacagtt cggattgggg accttgtaag tactgaccag 480
ccatttggtc taagtgtggt ggaacttggg tttgatggta taccttttga tggcgtcatg 540
ggcttgaact accccaaact atccttctct ggagccattc ccatctttga caacctgagg 600
aatcaaggtg ccatttctga gcctgttttt gccttctact tgagcaaaga cgagcaggag 660
ggcagtgtgg tgatgtttgg tggggtggac caccgctact acaagggaga gctcaactgg 720
ataccactga tccaagcagg cgactggagt gtacacatgg acagcatctc catgaaaaga 780
aaggttattg cttgctctgg tggctgcaag gccgttgtgg acaccgggac atcactgatt 840
gaaggcccaa gaagactggt caataacata cagaagctca tcagagccat gccacggggt 900
tccgagtact acgtttcatg ttctgcggtc aataccctgc cccctattat cttcaccatc 960
aaaggcatca actacccagt gccagctcaa gcctacatcc tcaaggattc tagaggccac 1020
tgctatacca cctttaaaga ggacagattg agtccaccat ctacagagac ctggatcctg 1080
ggtgacgtct tcctgaggcg gtatttctcg gtctttgatc gaggaaatga caggattggc 1140
ctggcacggg cagtgtaa 1158

<210> 50
<211> 381
<212> PRT
<213> bovidae

<400> 50
Met Lys Trp Leu Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Ile Leu Asn Asn Phe Leu Lys Glu His Ala Tyr Arg Leu

```
         35                  40                  45

Ser Gln Ile Ser Ser Cys Gly Ser Asn Leu Thr Phe His Pro Leu Arg
     50                  55                  60

Asn Ile Lys Asp Arg Leu Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
 65                  70                  75                  80

Pro Gln Glu Phe Gln Val Ile Phe Asp Thr Gly Ser Ser Asp Leu Trp
                 85                  90                  95

Val Thr Ser Val Phe Cys Thr Ser Pro Thr Cys Ser Thr His Val Met
            100                 105                 110

Phe Arg His Phe Asp Ser Ser Thr Phe Arg Pro Thr Lys Lys Thr Phe
        115                 120                 125

Ser Ile Asn Tyr Gly Ser Gly Arg Met Lys Gly Val Val Val His Asp
    130                 135                 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145                 150                 155                 160

Ser Val Val Glu Leu Gly Phe Asp Gly Ile Pro Phe Asp Gly Val Met
                165                 170                 175

Gly Leu Asn Tyr Pro Lys Leu Ser Phe Ser Gly Ala Ile Pro Ile Phe
            180                 185                 190

Asp Asn Leu Arg Asn Gln Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
        195                 200                 205

Tyr Leu Ser Lys Asp Glu Gln Glu Gly Ser Val Val Met Phe Gly Gly
    210                 215                 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Ile Pro Leu Ile
225                 230                 235                 240

Gln Ala Gly Asp Trp Ser Val His Met Asp Ser Ile Ser Met Lys Arg
                245                 250                 255

Lys Val Ile Ala Cys Ser Gly Gly Cys Lys Ala Val Val Asp Thr Gly
            260                 265                 270

Thr Ser Leu Ile Glu Gly Pro Arg Arg Leu Val Asn Asn Ile Gln Lys
        275                 280                 285

Leu Ile Arg Ala Met Pro Arg Gly Ser Glu Tyr Tyr Val Ser Cys Ser
```

290 295 300

Ala Val Asn Thr Leu Pro Pro Ile Ile Phe Thr Ile Lys Gly Ile Asn
305 310 315 320

Tyr Pro Val Pro Ala Gln Ala Tyr Ile Leu Lys Asp Ser Arg Gly His
325 330 335

Cys Tyr Thr Thr Phe Lys Glu Asp Arg Leu Ser Pro Pro Ser Thr Glu
340 345 350

Thr Trp Ile Leu Gly Asp Val Phe Leu Arg Arg Tyr Phe Ser Val Phe
355 360 365

Asp Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 51
<211> 1154
<212> DNA
<213> bovidae

<400> 51
aggaaagaag catgaagtgg cttgtggtcc tcggacttgt ggccttctca gagtgcatag 60
tcaaaatacc tctaaggaga gtgaagacca tgagaaaagc cctcagtgga aaaaacatgc 120
tgaacaattt cctgaaggaa catgcttaca gactgtccca gatttctttt cgtggctcaa 180
atctaactag tcacccgctg agaaacatca aggatttggt ctacctggct aatatcacca 240
ttggaacacc ccctcaggag ttccaggttt tccttgacac aggctcatct gacttgtggg 300
tgccctctga cttttgcacc agcccaggct gttctaaaca cgttagattc agacatcttc 360
agtcttccac cttccggctt accaataaga ccttcagcat cacctatgga tctgggagaa 420
ttaaaggagt tgttgctcat gacacagttc ggattgggga ccttgtaagc actgaccagc 480
cgttcagtct aagcatggca gaatacgggc ttgagcatat acctttgat ggcatcttgg 540
gcttgaacta ccccaacgta tcttcttctg gagcaatccc tatctttgac aagctgaaga 600
atcaaggtgc catttctgaa cctgtttttg ccttctactt gagcaaagac aagcaggagg 660
gcagtgtggt gatgtttggt ggggtggacc atcgctatta caggggaaag ctcaactggg 720
taccattgat ccaagcggga aactggatta tacacatgga cagcatctcc attgaaagaa 780
aggttattgc ttgttctgga ggctgcgtgg cctttgttga catcgggaca gcattcatcg 840
aaggcccaaa accactggtc gataacatgc agaagctcat cagggccaag ccatggcgtt 900
ccaagcacta tgtttcatgt tctgcggtca atacactgcc ctctattacc ttcaccatca 960
acggcatcaa ctacccagtg ccaggtcgag cctacatcct caaggattct agacgccgtt 1020
gctatagcac ctttaaagag atcccattga gtccaactac agagttctgg atgctgggtg 1080
acgtcttcct gaggctgtat ttctcagtct ttgatcgagg aaatgacagg attgggctgg 1140
cacgggcagt gtaa 1154

<210> 52
<211> 380
<212> PRT

<213> bovidae

<400> 52

Met Lys Trp Leu Val Val Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Ala Leu Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu His Ala Tyr Arg Leu
35 40 45

Ser Gln Ile Ser Phe Arg Gly Ser Asn Leu Thr Ser His Pro Leu Arg
50 55 60

Asn Ile Lys Asp Leu Val Tyr Leu Ala Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Phe Leu Asp Thr Gly Ser Ser Asp Leu Trp
85 90 95

Val Pro Ser Asp Phe Cys Thr Ser Pro Gly Cys Ser Lys His Val Arg
100 105 110

Phe Arg His Leu Gln Ser Ser Thr Phe Arg Leu Thr Asn Lys Thr Phe
115 120 125

Ser Ile Thr Tyr Gly Ser Gly Arg Ile Lys Gly Val Val Ala His Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Ser Leu
145 150 155 160

Ser Met Ala Glu Tyr Gly Leu Glu His Ile Pro Phe Asp Gly Ile Leu
165 170 175

Gly Leu Asn Tyr Pro Asn Val Ser Ser Ser Gly Ala Ile Pro Ile Phe
180 185 190

Asp Lys Leu Lys Asn Gln Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Asp Lys Gln Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Arg Tyr Tyr Arg Gly Lys Leu Asn Trp Val Pro Leu Ile
225 230 235 240

Gln Ala Gly Asn Trp Ile Ile His Met Asp Ser Ile Ser Ile Glu Arg
245 250 255

Lys Val Ile Ala Cys Ser Gly Gly Cys Val Ala Phe Val Asp Ile Gly
260 265 270

Thr Ala Phe Ile Glu Gly Pro Lys Pro Leu Val Asp Asn Met Gln Lys
275 280 285

Leu Ile Arg Ala Lys Pro Trp Arg Ser Lys His Tyr Val Ser Cys Ser
290 295 300

Ala Val Asn Thr Leu Pro Ser Ile Thr Phe Thr Ile Asn Gly Ile Asn
305 310 315 320

Tyr Pro Val Pro Gly Arg Ala Tyr Ile Leu Lys Asp Ser Arg Arg Arg
325 330 335

Cys Tyr Ser Thr Phe Lys Glu Ile Pro Leu Ser Pro Thr Thr Glu Phe
340 345 350

Trp Met Leu Gly Asp Val Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 53
<211> 1154
<212> DNA
<213> bovidae

<400> 53
aggaaagaag catgaagtgg cttgtgctcc tcggtctggt ggccttctca gagtgcatat 60
tcaaaatacc tctaaggaga gtgaagacca tgagaaaaac cctcagtgga aaaaacatgc 120
tgaacaattt cctgaaggag catccttaca aactgtccca gatttctttt cgtggctcaa 180
atctaaccac tctcccactg aggaacatct gggatatatt ctacataggt accatcacca 240
ttggaacacc ccctcaggaa ttccaggttg tctttgacac agcctcatct gacttgtggg 300
tgccctccat catttgcaac agctcaacct gttctacaca cgttagattc agacatcgtc 360
agtcttccac cttccggctt accaataaga cgttcgggat cacgtatgga tctgggagaa 420
tgaaaggagt tgttgttcat gacacagttc ggattgggga ccttgtaagt actgaccagc 480
cattcggtct aagcgtggcg gaatacgggt ttgagggcag aagatttgat ggtgtcttgg 540
gcttgaacta ccccaacata tccttctcta aagccatccc catctttgat aagctgaaga 600
atgaaggtgc catttcagag cctgtttttg ccttctactt gagcaaagac aagcagaagg 660
gcagtgtggt gatgtttggt ggggtggacc accgctacta caaaggagag ctcaactggg 720
taccattgat ccgagcgggt gactggagtg tacacgtaga ccgcatcacc atgaaaggag 780
aggttattgg ttgttctgat ggctgcacgg ccatggtgga caccgggtca tcaaatatcc 840

aaggcccagg aagagtgatc gataacatac acaagctcat tggtgccaca ccacggggtt 900
ccaagcacta cgtttcatgt tctgcggtca gtgctctgcc ctctgttgtc ttcaccatca 960
atggcatcaa ctacccagtg ccagctcgag cctacgtcct caaggatttt acaggcaact 1020
gctacaccac ctttaaagag aaaagggtaa ggagatctac ggagttctgg atcctgggtg 1080
aagccttcct gaggctgtat ttctcggtct ttgatcgagg aaatgacagg attggcctgg 1140
cacgggcagt gtaa 1154

<210> 54
<211> 380
<212> PRT
<213> bovidae

<400> 54

Met	Lys	Trp	Leu	Val	Leu	Leu	Gly	Leu	Val	Ala	Phe	Ser	Glu	Cys	Ile
1				5				10					15		
Phe	Lys	Ile	Pro	Leu	Arg	Arg	Val	Lys	Thr	Met	Arg	Lys	Thr	Leu	Ser
			20					25					30		
Gly	Lys	Asn	Met	Leu	Asn	Asn	Phe	Leu	Lys	Glu	His	Pro	Tyr	Lys	Leu
		35					40					45			
Ser	Gln	Ile	Ser	Phe	Arg	Gly	Ser	Asn	Leu	Thr	Thr	Leu	Pro	Leu	Arg
	50					55					60				
Asn	Ile	Trp	Asp	Ile	Phe	Tyr	Ile	Gly	Thr	Ile	Thr	Ile	Gly	Thr	Pro
65					70					75					80
Pro	Gln	Glu	Phe	Gln	Val	Val	Phe	Asp	Thr	Ala	Ser	Ser	Asp	Leu	Trp
				85					90					95	
Val	Pro	Ser	Ile	Ile	Cys	Asn	Ser	Ser	Thr	Cys	Ser	Thr	His	Val	Arg
			100					105					110		
Phe	Arg	His	Arg	Gln	Ser	Ser	Thr	Phe	Arg	Leu	Thr	Asn	Lys	Thr	Phe
		115					120					125			
Gly	Ile	Thr	Tyr	Gly	Ser	Gly	Arg	Met	Lys	Gly	Val	Val	Val	His	Asp
	130					135					140				
Thr	Val	Arg	Ile	Gly	Asp	Leu	Val	Ser	Thr	Asp	Gln	Pro	Phe	Gly	Leu
145					150					155					160
Ser	Val	Ala	Glu	Tyr	Gly	Phe	Glu	Gly	Arg	Arg	Phe	Asp	Gly	Val	Leu
				165					170					175	
Gly	Leu	Asn	Tyr	Pro	Asn	Ile	Ser	Phe	Ser	Lys	Ala	Ile	Pro	Ile	Phe
			180					185					190		

Asp Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Val Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Asp Lys Gln Lys Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile
225 230 235 240

Arg Ala Gly Asp Trp Ser Val His Val Asp Arg Ile Thr Met Lys Gly
245 250 255

Glu Val Ile Gly Cys Ser Asp Gly Cys Thr Ala Met Val Asp Thr Gly
260 265 270

Ser Ser Asn Ile Gln Gly Pro Gly Arg Val Ile Asp Asn Ile His Lys
275 280 285

Leu Ile Gly Ala Thr Pro Arg Gly Ser Lys His Tyr Val Ser Cys Ser
290 295 300

Ala Val Ser Ala Leu Pro Ser Val Val Phe Thr Ile Asn Gly Ile Asn
305 310 315 320

Tyr Pro Val Pro Ala Arg Ala Tyr Val Leu Lys Asp Phe Thr Gly Asn
325 330 335

Cys Tyr Thr Thr Phe Lys Glu Lys Arg Val Arg Arg Ser Thr Glu Phe
340 345 350

Trp Ile Leu Gly Glu Ala Phe Leu Arg Leu Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Asp Arg Ile Gly Leu Ala Arg Ala Val
370 375 380

<210> 55
<211> 1320
<212> DNA
<213> bovidae

<400> 55
gtcgacggaa agaagcatga agtgggttgt gctccttggg ctggtggcct tctcagagtg 60
catagtcaaa atacctctaa ggcgagtgaa gaccatgaga aaaaccctca gtggtaaaaa 120
catgctgaac aatttcttga aggagcatgg taacagattg tccaagattt cttttcgtgg 180
ctcaaatcta actactctcc cgctgagaaa catcgaggat ttgatgtacg tgggtaacat 240

caccattgga acacccccac aggaattcca ggttgtcttt gatacaggct catctgactt 300
ttgggtgccc tccgactttt gcactagtcc agactgtatt acacacgtta gattcagaca 360
acatcagtct tccaccttcc ggcctaccaa taagaccttc agcatcacct atggatctgg 420
gagaatgaga ggagttgttg ttcatgacac agttcggatt ggggaccttg taagtactga 480
ccagccgttc ggtctaagcg tgtcagaata cgggtttaag gacagagctt atgatggcat 540
cctgggcttg aactaccccg acgaatcctt ctctgaagcc atccccatct ttgacaagct 600
aaagaatgaa ggtgccattt ctgagcctat ttttgccttc tacttgagca aaaaaaagcg 660
ggagggcagt gtggtgatgt ttggtggggt ggaccaccgc tactacaagg gagagctcaa 720
ctgggtacca ttgatcgaag agggtgactg gagtgtacgc atggacggca tctccatgaa 780
aacaaaggta gttgcttgtt ctgacggctg cgaggctgtt gttgacactg ggacatcact 840
gataaaaggc ccaagaaaac tggtcaataa aatacagaag ctcattggtg ccacgccacg 900
gggttccaag cactacgttt attgttctgc ggtcaatgct ctgccctcta ttatcttcac 960
catcaatggc atcaactacc cagtgccagc tcgagcctac attctcaagg attctagagg 1020
ccgctgctat accgccttta aaaagcaacg attcagttca tctacagaga cctggctcct 1080
gggtgacgcc ttcctgaggg tgtatttctc ggtctttgat cgaggaaatg gcaggattgg 1140
cctggcacag gcagtgtaaa tgcttggagt ggttcaagaa tcagtaaggc cgcttntaac 1200
acacactcac tcacactagg gcactcctgc ccaggatggt ggtgaactgt atttggtggt 1260
ctgtacaccc tattctcagt gaagaataaa cggtttcact cttaatggtg ctgaaaaaaa 1320

<210> 56
<211> 380
<212> PRT
<213> bovidae

<400> 56
Met Lys Trp Val Val Leu Leu Gly Leu Val Ala Phe Ser Glu Cys Ile
1 5 10 15

Val Lys Ile Pro Leu Arg Arg Val Lys Thr Met Arg Lys Thr Leu Ser
20 25 30

Gly Lys Asn Met Leu Asn Asn Phe Leu Lys Glu His Gly Asn Arg Leu
35 40 45

Ser Lys Ile Ser Phe Arg Gly Ser Asn Leu Thr Thr Leu Pro Leu Arg
50 55 60

Asn Ile Glu Asp Leu Met Tyr Val Gly Asn Ile Thr Ile Gly Thr Pro
65 70 75 80

Pro Gln Glu Phe Gln Val Val Phe Asp Thr Gly Ser Ser Asp Phe Trp
85 90 95

Val Pro Ser Asp Phe Cys Thr Ser Pro Asp Cys Ile Thr His Val Arg
100 105 110

Phe Arg Gln His Gln Ser Ser Thr Phe Arg Pro Thr Asn Lys Thr Phe
115 120 125

Ser Ile Thr Tyr Gly Ser Gly Arg Met Arg Gly Val Val Val His Asp
130 135 140

Thr Val Arg Ile Gly Asp Leu Val Ser Thr Asp Gln Pro Phe Gly Leu
145 150 155 160

Ser Val Ser Glu Tyr Gly Phe Lys Asp Arg Ala Tyr Asp Gly Ile Leu
165 170 175

Gly Leu Asn Tyr Pro Asp Glu Ser Phe Ser Glu Ala Ile Pro Ile Phe
180 185 190

Asp Lys Leu Lys Asn Glu Gly Ala Ile Ser Glu Pro Ile Phe Ala Phe
195 200 205

Tyr Leu Ser Lys Lys Lys Arg Glu Gly Ser Val Val Met Phe Gly Gly
210 215 220

Val Asp His Arg Tyr Tyr Lys Gly Glu Leu Asn Trp Val Pro Leu Ile
225 230 235 240

Glu Glu Gly Asp Trp Ser Val Arg Met Asp Gly Ile Ser Met Lys Thr
245 250 255

Lys Val Val Ala Cys Ser Asp Gly Cys Glu Ala Val Val Asp Thr Gly
260 265 270

Thr Ser Leu Ile Lys Gly Pro Arg Lys Leu Val Asn Lys Ile Gln Lys
275 280 285

Leu Ile Gly Ala Thr Pro Arg Gly Ser Lys His Tyr Val Tyr Cys Ser
290 295 300

Ala Val Asn Ala Leu Pro Ser Ile Ile Phe Thr Ile Asn Gly Ile Asn
305 310 315 320

Tyr Pro Val Pro Ala Arg Ala Tyr Ile Leu Lys Asp Ser Arg Gly Arg
325 330 335

Cys Tyr Thr Ala Phe Lys Lys Gln Arg Phe Ser Ser Ser Thr Glu Thr
340 345 350

Trp Leu Leu Gly Asp Ala Phe Leu Arg Val Tyr Phe Ser Val Phe Asp
355 360 365

Arg Gly Asn Gly Arg Ile Gly Leu Ala Gln Ala Val
370 375 380